

PHYSALIS IN MEXICO, CENTRAL AMERICA
AND THE WEST INDIES^{1, 2}

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Linnaeus established *Physalis* in 1753 with a total of nine species. The genus was known to authors before *Species Plantarum* under *Solanum* as, for example, "Solanum vesicarium indicum minimum" (Hermann, 1679), and under *Alkekengi*, as illustrated by "Alkekengi indicum minimum" (Tournefort, 1716).

Miller (1768) described several species from Mexico, although few of his names have been identified with Mexican species in any account of the flora written since that time. Reinstated are the neglected Miller names *P. cordata* and *P. maxima* for relatively common species, with further discussion presented later.

The complexity of the genus, and the wide range of variability frequently encountered, the ambiguity of many of the earlier descriptions, as well as the unavailability of some of the types to those not so fortunate as to be able to make a trip to Europe to study them, have resulted in some duplication of names, as will become evident on perusal of the treatment of the species.

An example of a completely unrecognized name in the area under consideration is *P. glutinosa* Schlecht. Type material (HAL) shows this to be the very distinctive taxon

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²In specimen citations, the symbols used to indicate herbaria are the standard ones of Lanjouw and Stafleu (1964) with the addition of the symbol MEXP for the Herbarium of the Instituto Politécnico Nacional, Laboratorio de Botánica Fanerogámica, Mexico, D. F. To the Curators of all these herbaria the author is most grateful for the loan of their valuable specimens.

known in American herbaria as *Cacabus mexicanus* S. Wats., or as *Physalis eximia* Standley.

Some specific names might better be forgotten, if that were possible, or relegated to *nomina confusa*. For example, *P. Coztomatl* Dunal (1852) might very well be a form of *P. viscosa* L., but, observing the long, attenuate lobes of the flowering calyx, as shown on a photograph of the Sessé and Mociño Plate, one might with equal logic conclude it to be *P. orizabae* Dunal.

Physalis dentata Dunal (l. c.) is probably *P. acutifolia* (Miers) Sandwith; however, the Field Museum photograph, allegedly of this species, from "Types of the Berlin Herbarium", is not the large-flowered, long-pedicelled species from the Pavon Herbarium in the Boissier Herbarium at Geneva as shown by the Field Museum photograph, Negative No. 31435. The Berlin specimen, which I did not see personally when I was there, appears to be *P. chenopodifolia* Lam., a completely different species.

No study of the genus can be made without considering the limitations of related genera. Somewhat varying dispositions have been made of them in the past. One of the problems concerns the placement of those species having flowers in axillary fascicles, but fruits in enlarging, inflated calyces. These vary from species having axillary fascicles of 3-7 flowers, sometimes reduced to one, as in *P. arborescens* L. (*P. mayana* Standley) to those with (1-) 2-5 flowers per fascicle as in *P. chimalteca* Standley and Steyermark. In this group of species the corolla is more deeply lobed than is usual in the genus. In Wettstein (1891) these species would key to *Withania*, a genus said by him to occur in the tropics and subtropics of the Old World. In Standley (1924) they would key to *Athenaea* (although Standley and Steyermark have described several of them under *Physalis*); in Sleumer (1950) they would go to *Withania* emend. They are here referred to *Physalis*.

The equation of *Cacabus mexicanus* S. Wats. with *Physalis glutinosa* Schlechtendal is not intended to imply that *Cacabus* is synonymous with *Physalis*. *Physalis glutinosa* has enlarging fruiting calyces, much inflated about the

fruit in the manner characteristic of *Physalis*. Its corolla is campanulate, similar to those found in many species of *Physalis*, but larger than usual. In *Cacabus*, *sens. str.*, the calyx rather closely invests the fruit.

Not only does the well-developed fruiting calyx of *Cacabus hondurensis* (Donn.) Smith remove it from that genus, but the peculiar seeds mentioned by Standley (1931) seem to justify his disposition of it as the monotypic genus *Eutheta*.

Margaranthus in fruit cannot be distinguished from small-fruited species of *Physalis*, as the fruiting calyx enlarges similarly in both, but the pentangular-urceolate corolla of *Margaranthus* is quite distinctive. Dunal (1852) placed *Margaranthus* with genera of the *Solanineae* having longitudinally dehiscent anthers. Wettstein (1891) placed it in the *Lyciinae*. Sleumer (1950) returned it to "*Solaninae* Wettst. em."

To the present author it seems so closely related to *Physalis* that it should not be placed in a different subtribe. However, it is, for the time at least, not treated with *Physalis*.

Measurements given here are to be considered as generalized indication of size, but not necessarily as absolute quantities. No doubt in natural populations some deviation from them will be found. Width-measurements given for corollas mean the greatest width, *i. e.*, the width across the limb of fully expanded corollas. The length of calyces includes the calyx lobes, although these are usually given separately, too.

PHYSALIS L., *Species Plantarum* 182. 1753; *Alkekengi* Tourn. ex Hall, *Enum. Stirp. Helv.* 2:508. 1742; *Herschellia* Bowdich, *Excurs. Mader.* 159. 1825; *Quincula* Raf., *Atl. Journ.* 145. 1832; *Alicabon* Raf., *Sylva Tellur.* 56. 1838; *Pentaphiltrum* Reichb., *Das Herbarienbuch* 121. 1841; *Boberella* Krause, in Sturm, *Fl. Deutschl.* ed 2 (10):54. 1903.

Plants annual or perennial with herbaceous stems, rarely arborescent, from a few centimeters tall to 3 meters tall, equally wide and densely branched with stems as much as 3 cm in diameter; rhizomatous structures present in some species; leaves petioled, alternate, but sometimes two or even three apparently together due to internode

reduction; leaf blades usually ovate, but varying to linear; leaf margins from toothed, often coarsely and irregularly so, to entire; vestiture including long multicellular ("jointed") hairs, short hairs, stipitate or sessile glands, or branched or stellate trichomes, often more than one kind intermixed on the same plant; flowers pedicelled, usually single in the leaf-axils, but sometimes several and fascicled, rarely some of them in false racemes due to leaf and internode reduction; flowering calyces varyingly 5-lobed, on pedicels shorter than the calyx to several times its length; corollas plicate, from rarely tubular-expanded and apically constricted to often more or less campanulate to campanulate-rotate, or the limb even more or less reflexed; corollas usually yellowish, often with 5 darker, contrasting maculations occupying varying amounts of the area above the lower tubular part, these maculations usually discrete, sometimes more or less coalescing, solid in color, or each consisting of several to many separate spots; sometimes the maculations not strongly contrasting, sometimes absent; varying amounts of hair usually present in the tube near the point of filament-divergence, sometimes as 5 hairy pads, sometimes very few hairs present, or none, sometimes these areas more or less glandular; stamens 5, anthers dehiscing longitudinally, oblong or linear-oblong to ovate, yellow to blue, violet or greenish blue, or sometimes so tinged or lined; filaments slender and filiform to nearly as wide as the anthers; style filiform, the stigma capitate to nearly truncate; fruit a 2-carpellate, few-seeded to many-seeded berry, which, however, often has a thin dryish pericarp; fruit usually sessile in the calyx which is usually inflated around it, but the berry rarely growing large enough to be tightly invested by the calyx; sometimes a short gynophore is present; fruiting calyx often invaginated basally; fruiting pedicels usually elongating; seeds nearly orbicular to reniform, usually more or less punctate to irregularly reticulate.

KEY

1. Corolla 5-lobed; flowers several to 1 or 2 in leaf axils.
 2. Corolla 8-12 mm long and 10-15 (-20) mm wide.
 3. Flowers usually several in the leaf axils; fruits may be single; stem hairs more or less spreading.
 4. Stem hairs dendritic. 1. *P. arborescens*.
 4. Stem hairs simple. 7. *P. melanocystis*.
 3. Flowers usually 1-2; fruits usually single; stem hairs antrorsely appressed (also see *P. melanocystis* var. *cernua*), some simple, some more or less dendritic. 2. *P. porphyrophyssa*.
 2. Corolla (15-) 18-22 mm long and (25-) 30-45 mm wide.
 5. Calyx lobes more or less elongate.
 6. Calyx prominently hairy at anthesis. 3. *P. amica*.
 6. Calyx essentially glabrous. 4. *P. amphitrica*.
 5. Calyx subtruncate to more or less short-lobed.
 7. Calyx prominently hairy at anthesis. 5. *P. calidaria*.

7. Calyx essentially glabrous. 6. *P. chimalteca*.
1. Corolla apically 5-angled with shallow sinuses, or subtruncate; flowers solitary (excepting sometimes, by stem and leaf reduction, in *P. angustior* and *P. aggregata*).
8. Corolla campanulate with a long limb, to tubular-campanulate, to subtubular and apically constricted, 22-35 mm long.
9. Corolla limb not expanded.
10. Plant nearly glabrous. 8. *P. constricta*.
10. Plant prominently vestite, the hairs at least partly capitate-glandular. 9. *P. campula*.
9. Corolla limb more or less expanded.
11. Herbage greenish. 10. *P. glutinosa*.
11. Herbage cinereous-vestite. 11. *P. cinerea*.
8. Corolla open-campanulate to rotate or reflexed-rotate at full anthesis, smaller (except *P. amphitrica*).
12. Corolla bluish; indument scale-like. 52. *P. lobata*.
12. Corolla yellowish to whitish to bluish-tinged, rarely bluish, but then indument not scale-like.
13. Fruiting calyx 10-ribbed, subequally 10-angled, or teretish.
14. Indument of stellate hairs, rarely partly dendritic.
..... 12. *P. viscosa*.
14. Indument various but not stellate, sometimes dendritic or partly so, sometimes none.
15. Flowering pedicels shorter than the calyx to 2-3 times its length, usually 1-10 mm long, but in rare cases some of them becoming 15-30 mm long.
16. Anthers large, (2-) 2.2-4 mm long.
17. Vestiture of stems, petioles and pedicels in part of spreading, jointed hairs 2-3 mm long.
18. Leaf blades ovate, usually broadly so, sometimes narrowly so.
19. Blades of principal cauline leaves (8-) 12-20 cm long, smaller ones one-third to one-fourth as large.
20. Some of the hairs tipped with reddish glands; throat of corolla densely hairy; anthers blue.
21. Corollas 25-35 mm wide.
..... 14. *P. stapelioides*.
21. Corollas 15-22 mm wide.
..... 25. *P. Sancti-josephi*.
20. Hairs not tipped with reddish glands; throat of corollas nearly glabrous; anthers yellow. 22. *P. luteoanthera*.
19. Blades of principal cauline leaves usually 2-6 cm. long.
22. Only a few long hairs on stems and peti-

- oles; principal leaf blades usually 2-6 cm long.
23. Flowering calyces prominently hairy; anthers with only a tinge of blue. 21. *P. gracilis*.
23. Flowering calyces with only a few long hairs; anthers blue. 43. *P. philadelphica*.
22. Stems, leaves and petioles with abundant long hairs; leaf blades usually 1.5-2 cm long.
24. Anthers bluish, or so tinged or lined; leaf blades entire or with 1-3 coarse teeth on each side.
25. Leaf blades oval to ovate, entire, principal ones 5-6 cm long. 29. *P. latecorollata*.
25. Leaf blades ovate to hastate-ovate or hastate-deltoid with 1-3 coarse teeth on each side. 30. *P. philippensis*.
24. Anthers yellow; leaf blades irregularly several-toothed. 33. *P. tehuacanensis*.
18. Leaf blades lanceolate-ovate to linear-lanceolate. 31. *P. caudella*.
17. Vestiture various, or absent, but not including jointed hairs 2-3 mm long.
26. Anthers yellow, not bluish tinged or lined.
27. Corolla prominently dark maculate.
28. Leaf blades ovate, sometimes apically attenuate.
29. Flowering calyx with short multicellular hairs 0.2-0.3 mm long. 16. *P. ingrata*.
29. Flowering calyx with multicellular hairs ca. 0.5-1.0 mm long (or glabrous in some extremes).
30. Hairs (when present) ca. 1 mm long, more or less spreading; leaves often longer than the internodes. 21. *P. gracilis*.
30. Hairs of flowering calyx ca. 0.5-0.7 mm long, antrorsely curled; principal cauline leaves often one-half to one-third as long as the internodes. 41. *P. longicaulis*.
28. Leaf blades ovate-lanceolate to linear-lanceolate. 32. *P. virginica*.

27. Corolla immaculate, or with spots only slightly differentiated in color.
31. Fruiting calyces usually 2-3 cm long.
32. Fruiting calyx nearly filled by berry, open apically. 26. *P. Muelleri*.
32. Fruiting calyx inflated around the berry, apically closed or nearly closed.
..... 36. *P. hederæfolia*.
31. Fruiting calyces ca. 1 cm long.
33. Leaf blades deltoid to ovate-deltoid, expanding abruptly from the petiole.
..... 34. *P. microphysa*.
33. Leaf blades lanceolate to lanceolate-ovate, gradually expanding from the petiole. 42. *P. Rydbergii*.
26. Anthers bluish, purple, violet or greenish-blue, or so tinged or lined (sometimes fading in drying).
34. Some of the flowers in few-flowered, terminal, apparently false racemes, formed by shortening of internodes and reduction of leaves.
35. Corollas 13-15 mm wide.
..... 17. *P. aggregata*.
35. Corollas 20-29 mm wide.
..... 24. *P. angustior*.
34. Flowers solitary.
36. Corollas prominently marked with 5 dark patches, these sometimes confluent basally.
37. Flowering calyx with divergent hairs.
38. Fruiting calyx evenly covered with hairs, or hairs more abundant on principal veins, but also scattered between them.
39. Fruiting calyx usually 30-40 mm long and 20-25 mm wide; anthers ca. 4 mm long.
40. Leaf blades more or less cordate, principal ones usually 6-9 cm long, apices often somewhat lunate-attenuate. 23. *P. peruviana*.
40. Blades rarely semicordate, usually 4-5 cm long, apices sometimes slightly one-sided, but not lunate-attenuate. 18. *P. lassa*.
39. Fruiting calyx (15-) 20-25 (-30) mm long and (11-) 13-18 (-20) mm

- wide; anthers 2.5-3 (-4) mm long.
41. Corollas 10-30 mm wide when fully open; maculations 3-7 mm long.
42. Corollas 2-3 cm wide; flowering calyces 8-9 mm wide at base of lobes. 24. *P. angustior*.
42. Corollas 10-18 mm wide; flowering calyces 4-7 (-8) mm wide at base of lobes.
43. Principal leaf blades 6-10 cm long 25. *P. Sancti-josephi*.
43. Principal leaf blades 2-7 cm long.
44. Vestiture of flowering calyx including jointed hairs 0.5-1 mm long. 27. *P. sordida*.
44. Flowering calyx densely vestite with jointed hairs 1-1.5 mm long. 28. *P. Pennellii*.
41. Corollas 8-9 mm wide; maculations ca. 1 mm long. 46. *P. minimaculata*.
38. Fruiting calyx with a few hairs, often on ribs, or none.
45. Fruiting pedicels 1-2 cm long.
46. Anthers dark blue to purplish. 31. *P. caudella*.
46. Anthers yellowish, tinged or lined with light blue or violet. 32. *P. virginiana*.
45. Fruiting pedicels 2-5 mm long. 43. *P. philadelphica*.
37. Flowering calyx with appressed hairs or none.
47. Blades of principal leaves ca. ovate.
48. Hairs of stems, petioles and pedicels antrorse; plants perennial.
49. Fruiting pedicels 4.5-5 cm long. 13. *P. Mcvaughii*.
49. Fruiting pedicels 1-2 cm long.
50. Leaf surfaces with a few scattered appressed hairs, or glabrate. 15. *P. orizabae*.
50. Surfaces or young leaves, or all leaves, greyish with abundant,

- more or less antrorsely appressed hairs.
 19. *P. chenopodifolia*.
48. Shorter hairs of stems, petioles and pedicels retrorse, sometimes none.
 43. *P. philadelphica*.
47. Leaf blades lanceolate to linear-lanceolate.
51. Many of the leaf blades more or less hastate, or with 1-3 large teeth, basal or as far up as the middle of the blade. 20. *P. hastatula*.
51. Leaves neither hastate, nor with 1-3 large teeth on basal half of blade.
 32. *P. virginiana*.
36. Corollas immaculate, or with spots light colored and not strongly contrasting.
52. Stems, petioles and pedicels with spreading hairs, some gland-tipped.
 27. *P. sordida*.
52. Stems, petioles and pedicels with few, short, appressed hairs, or none.
53. Fruiting pedicels 6-7 mm long; hairs retrorse. 44. *P. michoacanensis*.
53. Fruiting pedicels (7) 10-25 mm long; hairs retrorse or none.
54. Vestiture more or less abundant and greyish. 19. *P. chenopodifolia*.
54. Plant with few short hairs, or glabrous. 45. *P. angulata*.
16. Anthers small, 0.5-1.8 (-2) mm long.
55. Corollas (6-) 5-15 (-20) mm wide and 5-9 mm long.
56. Stems spreading-hairy.
57. Corollas 15-20 mm wide; anthers dark blue.
 35. *P. parvianthera*.
57. Corollas 8-10 mm wide; anthers yellow.
 42. *P. Rydbergii*.
56. Stems glabrous, or with few, short, upwardly appressed hairs.
58. Principal leaves 1.2-4 mm long, broadly ovate to reniform. 39. *P. Mimulus*.
58. Principal leaves 5-11 cm long, ovate, lanceolate-ovate, or narrower. 45. *P. angulata*.
55. Corollas small, 5-7 mm wide and 5-7.5 mm long.
59. Fruiting calyx 20-35 mm long.

- 60. Fruiting calyx with smooth ribs.
..... 43. *P. philadelphica*.
- 60. Ribs of fruiting calyx with more or less
tooth-like lamellations developing at the bases
of some of the hairs, or replacing the hairs.
..... 47. *P. ampla*.
- 59. Fruiting calyx 5-20 mm long.
 - 61. Fruiting calyx 13-20 mm long.
..... 48. *P. Lagascae*.
 - 61. Fruiting calyx 5-11 mm long.
 - 62. Corolla 5-10 mm long; fruiting pedicels
(5-) 10-15 mm long, usually longer than
the fruiting calyx. 51. *P. sulphurea*.
 - 62. Corolla ca. 3.5 mm long; fruiting pedicels
ca. 5 mm long, shorter than the fruiting
calyx. 49. *P. microcarpa*.
- 15. Flowering pedicels usually (10-) 15-40 mm long,
several times the length of the flowering calyx.
 - 63. Anthers yellow.
 - 64. Corolla yellowish, sometimes with slightly con-
trasting spots, sometimes drying bluish.
 - 65. Leaf blades ovate to narrowly lanceolate and
sometimes more or less hastate, margins entire
or with 1-2 usually obscure teeth on each side.
..... 37. *P. glabra*.
 - 65. Leaf blades usually ca. ovate, if lanceolate then
usually with several teeth on each margin;
stems more or less vestite. 38. *P. crassifolia*.
 - 64. Corollas purplish, violet or bluish, the throat
yellow. 40. *P. purpurea*.
 - 63. Anthers bluish or bluish-green, at least on their
margins.
 - 66. Corollas campanulate-funnelform; anthers usually
1-2.5 mm long, not twisted. 45. *P. angulata*.
 - 66. Corollas rotate to reflexed-rotate; anthers usually
2.5-3.5 mm long, sometimes twisted at maturity.
..... 50. *P. acutifolia*.
- 13. Fruiting calyx 5-angled.
 - 67. Flowering calyx large (5-) 7-10 (-14) mm wide at base
of lobes.
 - 68. Hairs more or less dendritic or branching.
..... 53. *P. Hintonii*.
 - 68. Hairs not dendritic.
 - 69. Calyx lobes narrow, long-attenuate.
 - 70. Leaves cordate. 54. *P. Greenmanii*.
 - 70. Leaves not cordate, varyingly narrowed basally.
..... 55. *P. Pringlei*.

69. Calyx lobes deltoid or ovate to lanceolate, acuminate.
71. Leaf blades ca. ovate.
72. Stem hairs long, spreading, jointed; stems herbaceous.
73. Fruiting calyx only a little longer than wide.
..... 55. *P. Pringlei*.
73. Fruiting calyx 1.5-2 times longer than wide.
..... 57. *P. subrepens*.
72. Stems glabrescent, the few hairs short, appressed; stem lignescent. 62. *P. jaliscensis*.
71. Leaf blades deltoid-ovate, sometimes subhastate, principal ones 15-25 mm long and 12-20 mm wide.
..... 30. *P. philippensis*.
67. Flowering calyx usually 2-5 (-6) mm wide at base of lobes.
74. Fruiting calyx narrow, about twice as long as wide.
75. Flowering pedicels 8-45 mm long.
76. Corollas prominently maculate; anthers bluish.
77. Pedicels 15-40 mm long; herbaceous vine.
..... 58. *P. volubilis*.
77. Pedicels 8-15 mm long; stems lignescent.
..... 61. *P. lignescens*.
76. Corollas immaculate, or spots not contrasting; anthers yellow or greenish-yellow.
..... 59. *P. viridoflava*.
75. Flowering pedicels 3-5 mm long.
..... 56. *P. angustiphysa*.
74. Fruiting calyx as long as wide to 1.5 times longer than wide.
78. Vestiture dense, of more or less branching, jointed hairs. 77. *P. vestita*.
78. Hairs unbranched, or none.
79. Fruiting calyx densely greyish short-hairy (as usually all herbage); gynophore and inside of fruiting calyx capitate-glandular.
..... 68. *P. ignota*.
79. Fruiting calyx glabrous or variously vestite, but not densely greyish short-hairy; inside of fruiting calyx not capitate-glandular excepting sometimes in *P. turbinata*.
80. Calyx lobes caudate-subulate to subulate - attenuate.
81. Flowering pedicels 15-75 mm long; stems, petioles and pedicels usually

- more or less pilose, longer hairs 1.5-4 mm long. 63. *P. maxima*.
81. Flowering pedicels usually 1-15 mm long; stems, petioles and pedicels glabrous to variously vestite, but not long-pilose.
82. Corollas immaculate, or with obscure markings with edges sometimes diffuse.
83. Corollas small, 4-8 mm long; well-developed fruiting calyces usually 40-65 mm long. 64. *P. nicandroides*.
83. Well-developed corollas (8-) 10-15 mm long and (10-) 15-25 mm wide; fruiting calyces usually 20-35 mm long. 69. *P. foetens*.
82. Corollas with small contrasting maculations ca. 2 mm long and 1 mm wide, or smaller in *P. latiphysa*.
84. Corollas 4-6 mm long; anthers 1-1.8 mm long.
85. Fruiting calyx 15-23 mm wide. 70. *P. subulata*.
85. Fruiting calyx (25-) 30-40 mm wide. 67. *P. latiphysa*.
84. Corollas (8-) 10-15 mm long; anthers (1.5-) 2-3 mm long. *P. foetens*.
80. Calyx lobes ovate to narrowly triangular - attenuate, but not subulate.
86. Fruiting calyx hairy.
87. Well-developed fruiting pedicels 20-45 cm long. 60. *P. longipedicellata*.
87. Fruiting pedicels 3-12 mm long.
88. Corolla maculate, spots strongly contrasting.
89. Hairs of stem short, antrorsely appressed or curled; flowering calyx two-thirds or three-fourths divided into narrowly lanceolate-triangular lobes 4-5 mm long; fruiting calyx obscurely 5-angled. 19. *P. chenopodifolia*.
89. Stem-hairs more or less spread-

- ing; flowering calyx usually divided no more than half way.
90. Leaf blades more or less translucent when dry; some of the hairs with brownish glands. 75. *P. leptophylla*.
90. Leaves thicker, opaque; hairs usually without brownish glands.
91. Fruiting calyx 15-30 (-32) mm long.
92. Anthers bluish.
93. Lobes of fruiting calyx ovate-deltoid to lanceolate. .. 74. *P. pubescens*.
93. Lobes of fruiting calyx narrowly lanceolate, tips approaching subulate. 71. *P. angustiloba*.
92. Anthers yellow, 1.2-1.6 mm long. 72. *P. turbinatoides*.
91. Fruiting calyx 30-40 mm long. 73. *P. turbinata*.
88. Corolla immaculate, or with spots not contrasting.
94. Anthers blue. 69. *P. foetens*.
94. Anthers yellow, sometimes tinged with green or blue. 76. *P. hylophila*.
86. Fruiting calyx glabrous or essentially so.
95. Fruiting calyx 25-35 mm long.
96. Lobes of fruiting calyx 7-13 mm long.
97. Corolla maculations prominent; fruiting calyx usually gradually terminated apically. 65. *P. cordata*.
97. Corolla maculations not prominent, their edges often diffuse; fruiting calyx more or less porrect. 66. *P. porrecta*.
96. Lobes of fruiting calyx 4-6 mm long. 78. *P. clarionensis*.
95. Fruiting calyx 10-18 mm long.
98. Anthers 1.3-2 mm long; fruiting

- calyx 15-18 mm long.
 79. *P. minuta*.
 98. Anthers ca 1 mm long; fruiting
 calyx 10-13 mm long.
 99. Young parts sparingly short-
 hairy; leaf blades ovate to
 oblong-ovate or ovate-lanceolate.
 80. *P. carnosa*.
 99. Plant glabrous; leaves reniform
 to ovate. 39. *P. Mimulus*.

THE SPECIES

1. *Physalis arborescens* L., Species Plantarum, ed 2:261. 1762;
P. mayana Standley, Field Mus. Publ. Bot. 8:42. 1920.

Shrubby, 0.5-2 m high, more or less tomentose with somewhat dendritic hairs, leaf blades ovate to rhombic ovate, somewhat acuminate, entire to irregularly few-toothed, sometimes undulate, rarely salient-toothed; blade gradually narrowed to a petiole 1-4 cm long; principal blades (6-) 9-12 cm long and (4-) 6-8 cm wide; lower leaf surfaces usually densely dendritic-hairy or stellate-hairy, upper surfaces less so; flowers in axillary fascicles of 3-7, sometimes reduced to 1, maturing at different times, the inflorescence probably representing a reduced branch, often maturing only 1 fruit; flowering calyx more or less herbaceous, oblong-hemispheric or short-oblong to nearly square, 5-7 mm long, divided above into ca. ovate lobes ca. 3 mm long, on pedicels 6-12 mm long; corolla 8-12 mm long, prominently dark-maculate, divided into lobes 3-5 mm long; anthers yellow, ca. 4 mm long and 1.5 mm wide, their filiform filaments ca. 2 mm long; fruiting calyx ovoid, 2-3.5 cm long and 1.8-2.5 cm wide, slightly to densely covered with simple or 2-branched to stellate trichomes; fruiting pedicels 10-15 mm long; berry 7-11 mm in diameter, sessile on the somewhat invaginated calyx-base.

SELECTED SPECIMENS. MEXICO: CAMPECHE: *Houstoun* HS 295 76, left side (BM); VERA CRUZ: 2 km south of Tampico, Feb. 1910, *Palmer* 379 (BM, F, GH, NY, US); YUCATAN: Chichankanab, *Gaumer* 24381, type collection of *P. mayana* Standley, (Type: F, Isotype: US); Mérida-Uxmal road, *Lundell* 8083 (MICH, US).

The *Houstoun* collection in the Sloane Herbarium of the British Museum can be taken as the LECTOTYPE of the species. Linnaeus (l.c. supra) referred to Miller's Dictionary, t. 206, f. 2, and stated "Habitat in Campechia". The eighth edition of Miller's Dictionary refers to the same figure and says, "The eighth sort was discovered by the late Dr. Houstoun growing naturally in Campeachy from whence he sent seeds to England".

This collection is obviously the same species later described from Yucatan as *P. mayana*.

2. *Physalis porphyrophysa* Donnell-Smith, Bot. Gaz. 61: 377. 1916.

Shrub, 1-3 m tall, "subscandent" according to some collectors; young stems densely vestite with short, antrorsely curled hairs, glabrescent; leaf blades ca. ovate, slightly rhombic-ovate, or somewhat narrower, margins entire to slightly and irregularly undulate, larger ones 8-15 cm long and 5-7 cm wide, gradually narrowed to a short petiole ca. 1-3 cm long; hairs of the lower leaf surfaces abundant, simple, variously branched and stellate, the few on the upper surfaces usually simple; flowers in axillary fascicles of (1-) 2-4 (only a few flowering specimens seen), often only one maturing a fruit; flowering calyx 4-5 mm long, herbaceous, divided above into more or less triangular lobes ca. 2 mm long, pedicels 5-10 mm long, filiform, only slightly thickened near the base of the calyx; no expanded corollas seen, but some collectors state "flowers yellow"; a dissected pre-anthesis corolla appears slightly maculate, has oblong anthers ca. 3 mm long on short filiform filaments; fruiting calyx 10-ribbed, usually 25-35 mm long and 18-25 mm wide, sometimes purplish at maturity, on pedicels 6-12 mm long; berry ca. 12-15 mm in diameter, subsessile or on a short stipe up to 1.5 mm long on the invaginated calyx-base.

SPECIMENS SEEN. GUATEMALA: Uaxactun, arroyo, Mar. 20, 1931, *Bartlett 12163* (MICH, US); Apr. 7, 1931, *Bartlett 12519a* (MICH, US); on Maya ruins, Apr. 26, 1931, *Bartlett 12759* (MICH, US); south bank of Motagua River, June 19, 1909, *Deam 6357* (GH, MICH, US, VT); vicinity of Zacapa, Dec. 1906, *Pittier 1754* (Type: US); Zacapa, small subscandent shrub in hedge, Oct. 7-16, *Standley 74616* (F, NY, US).

3. *Physalis amica* Standley & Steyermark, Field Mus. Publ. Bot. 23: 231. 1947.

Herbaceous, ca. 1-7 m tall, branched, stems villose with jointed hairs, tending to be glabrescent; leaf blades ca. ovate somewhat acuminate, larger ones 6-7 cm long and 4-5 cm wide, their petioles ca. 1 cm long; leaf surfaces with scattered, jointed, more or less appressed flattened hairs, these sometimes reduced to bases only; flowers in axillary fascicles of 2-5 (probably reduced branches), sometimes only one; flowering calyx somewhat chartaceous, ca. 7 mm long, divided above into lanceolate or lanceolate-ovate lobes 1.5-3 mm long; pedicels ca. 1 cm long, prominently thickened upward to a width of 2-4 mm at base of calyx; pedicels and calyx villosulose; corolla nearly rotate, ca. 15 mm long and 30 mm wide, its lobes 5-8 mm long, broadly triangular to ovate-triangular, without obvious dark spots, matted-hairy in the tube; anthers bluish, oblong, ca. 3 mm long and half as wide; filaments filiform, ca. 3 mm long; fruit unknown.

GUATEMALA: vicinity of San Rafael, upper narrow reaches of stream, Feb. 20, 1940, *Steyermark 36175* (Type: F).

4. *Physalis amphitrica* (Bitter) Standley & Steyermark, Field Mus. Publ. Bot. 23: 229. 1947; *Saracha amphitrica* Bitter, Repert. Sp. Nov. 20: 362. 1924.

Herbaceous, 1-3 m tall, branched, stem sometimes weak and trailing, or said to be shrubby by a few collectors, glabrous, or with a few hairs when young; leaf blades ovate, acuminate, the larger ones usually 8-15 cm long and 4-8 cm wide, their petioles 1-2.5 cm long; leaf surfaces with a few short, jointed, flattened hairs, these sometimes reduced to mere bases; flowers in axillary fascicles of 2-5, sometimes only 1 evident, but abscission scars of others present; calyx at anthesis somewhat thin-chartaceous, glabrous outside, or with lobes slightly short-hairy, on pedicels 8-20 mm long, filiform, enlarged apically beneath the calyx; corolla yellowish or greenish-yellow, 20-25 mm long, ca. twice the length of the calyx, divided ca. half way into ovate to lanceolate, sometimes slightly acuminate lobes, with greenish-purplish markings near their bases, matted-hairy inside near the tube; anthers bluish to purplish, ca. 3-4 mm long, on filaments ca. 5 mm long; fruiting calyx seldom collected, 3.5 cm (immature) to 5.5 cm long and 3.5 cm wide, reticulate-veined, much inflated around the small berry.

SELECTED COLLECTIONS. MEXICO: CHIAPAS: Siltepec, Jan., 1937, *Matuda 254* (F, MICH, US); Boquerón, Sept., 1913, *Purpus 6671* (BM, GH, F, NY, UC, US). GUATEMALA: Chiquihuite, branched herb or shrub 5-10 ft., damp forest, Mar. 8, 1939, *Standley 68133* (F, US); above Mujulia, Feb. 1, 1941 (F); moist rocky slopes around waterfall, Río Negro, Volcán Tajumulco, *Steyermark 37660* (F, NY).

5. *Physalis calidaria* Standley & Steyermark, Field Mus. Publ. Bot. 23: 231-232. 1947.

Herb, 1-2 m tall, young stem with few to many short brownish antrorsely curled hairs, glabrescent; leaf-blades ovate to elliptic, gradually to abruptly acuminate, their margins entire to slightly acuminate, larger ones 8-15 cm long and 5-7 cm wide on petioles 15-35 mm long; blades sparsely appressed short-villosulose above and more or less curled-villosulose to appressed-villosulose on the abaxial surface, more abundantly so on midribs and veins, petioles similarly vestite; flowers in axillary fascicles of usually 4-5, some of them sometimes abscised at petiole bases; calyx short-hairy on outside, subtruncate, usually 4-10 mm long, its apex sinuate-margined with sepal-projections ca. 1.5-2 mm long, broadly expanding to the tube; corolla light yellow, with 5 slightly contrasting darker spots, rotate-campanulate, 15-20 mm long and 20-35 mm wide when fully expanded, very short-hairy externally and with 5 more or less confluent, densely hairy pads surrounding and above the point of insertion of the filaments; corolla divided about half-way into ovate to deltoid-ovate

lobes; anthers 2.5-3 mm long, on slender filaments 4-5 mm long, glabrous or with a few basal hairs; fruiting calyx glabrous, 10-angled, the 5 principal ones more prominent and basally auricled, a prominent reticulum between the 10 ribs; berry 8-10 mm in diameter, the surrounding calyx 25-30 mm long and 22-25 mm wide.

COLLECTIONS SEEN. GUATEMALA: Dept. of Quetzaltenango, 8000 ft., Feb. 4, 1941, *Hunnewell 17233* (GH); slopes of Volcán de Zunil, Feb. 3, 1941, *Standley 85932* (F); Fuentes Georginas, western slope of Volcán de Zunil, 2850 m, Mar. 4, 1939, *Standley 67488* (Type: F); between Todos Santos and Finca el Porvenir, lower to middle slopes of Volcán Tajumulco, Mar. 1, 1940, *Steyermark 36988* (F).

6. *Physalis chimalteca* Standley & Steyermark, Field Mus. Publ. Bot. **23**: 232. 1947.

Coarse herb, possibly woody below, herbarium specimens 0.5 m long, being tops of plants; stems glabrous, or slightly vestite above with appressed and more or less antrorsely curled hairs; leaf blades ovate, acuminate, larger ones 8-12 cm long and 4-8 cm wide, margins entire or with 1 to 3 large teeth or very shallow lobes on each side, petioles of larger leaves 1-2 cm long; leaf surfaces with a few flattened, jointed, usually appressed hairs, these sometimes reduced to bases only; flowers in axillary fascicles of (1-) 2-4, only one maturing a fruit in the few seen; calyx at anthesis thin-chartaceous, glabrous externally, the 5 shallow lobes marginally ciliate, the pedicel filiform, erect 8-10 mm long; corolla rotate to reflexed-rotate, densely covered externally with short, antrorsely appressed hairs; corolla 15-20 mm long, the upper 8-10 mm divided into lanceolate or ovate-lanceolate lobes, each basally with an area of a few discrete dark spots, below which matted hairs extend into the tube; anthers 2.5-3 mm long on filiform filaments 3-5 mm long; fruiting calyx 2.5-5 cm long and 2-3 cm wide, glabrous, reticulate-veined, berry oily, ca. 1 cm in diameter, sessile on the invaginated calyx.

SPECIMENS SEEN. MEXICO: CHIAPAS: Siltepac, Jan. 1937, *Matuda 250*, (F, MICH, US). GUATEMALA: Volcano Actenango, Feb. 7, 1907, *Kellerman 6610* (F); San Miguel Uspantan, April 1892, *Heyde et Lux 3435* (F); above Las Calderas, common on slopes of Volcán de Acatenango, Jan. 3, 1930, *Standley 61803* (Type: F); *ibid*, *Standley 61965* (F); slopes of Volcán de Zunil, wet forested quebrada, Feb. 3, 1941, (F).

7. *Physalis melanocystis* (Robinson) Bitter, Repertorium Specierum Novarum **20**: 369-370. 1924; *Withania melanocystis* Robinson, Proc. Amer. Acad. **26**: 171. 1891.

Woody, branched, height not determinable from collections; vestiture of short, unbranched, spreading or antrorse-appressed hairs; leaf blades lanceolate to ovate-lanceolate or rhombic-lanceolate, prin-

cipal ones 4-10 cm long and 1.5-5 cm wide on petioles 5-20 cm long; flowers in axillary fascicles of (1-) 3-6; corolla 8-10 mm long and 12-18 mm wide, its limb rotate or rotate-reflexed when fully expanded, divided above into ovate to deltoid-ovate lobes 3-6 mm long; maculations not strongly contrasting; anthers yellowish, 3-4 mm long, on filaments 1-2 mm long; flowering pedicels 4-10 mm long; fruiting calyx 17-25 mm long and 15-18 mm wide on pedicels 10-15 mm long; berry spheric, 10-13 mm in diameter.

7a. var. *melanocystis*

Vestiture of short, unbranched, dense, more or less spreading hairs, principal leaf blades 4-7 cm long and 1.5-3 cm wide on petioles 5-10 mm long.

SPECIMENS SEEN. MEXICO: SAN LUIS POTOSI: Tamasopo Canyon, 1890, *Pringle 3285* (GH, US); rocky limestone woods, Espinazo del Diablo, Tamosopo Canyon, Aug. 7, 1934, *Pennell 17959* (US); Bitter (l.c. supra) cites *Schiede 1189* (B) from Papantla, VERACRUZ.

7b. var. *cernua* (Donn.-Smith) Waterfall, comb. et stat. nov., *Athenaea cernua* Donn. Sm., Bot. Gaz. 48: 297. 1909.

A var. *melanocystis* differt caulibus trichomatibus curtis antrorso-adpressis; foliis majoribus 7-10 cm longis et 3-5 cm latis, petiolis 1-2 cm longis.

SPECIMENS SEEN. GUATEMALA: shaded bank of Motagua River, Gulan, June 15, 1909, *Deam 6279* (G, US). MEXICO: GUERRERO: Acapulco, Dec. 1955, *Paray 1813* (MEXP).

Although the two varieties are similar, the appressed vestiture and larger leaves of var. *cernua* seem to adequately distinguish it from the more northern var. *melanocystis*. Future collecting should find intermediate localities for the species.

8. *Physalis constricta* Waterfall, sp. nov.

Herba subglabra; foliis ovatis, majoribus 5-6 cm longis et 30-45 mm latis, margine inaequaliter magnodentato vel integerrimo, petiolis 15-25 mm longis; calycibus anthesi 11-12 mm longis et 6-7 mm latis, lobis triangularibus vel ovatis, 3-4 mm longis; pedicellis 4 cm longis; corollis 20-26 mm longis, mediis ca. 10 mm latis, sursum gradatim attenuatis, apertis constrictis, 5 mm latis; antheris 4 mm longis, filamentis filiformibus; calycibus fructiferis 28 mm longis et 20 mm latis, inflatis.

MEXICO: OAXACA: in 1842, *Ghiesbreght s.n.* (Type: P).

This distinctive species is characterized principally by its long, semitubular corollas, 20-26 mm long, expanded to a width of ca. 10 mm above the calyx and gradually narrowed above, then constricted into an aperture ca. 5 mm wide, essentially unlobed, and without a limb, and by its

long, erect pedicels, ca. 4 cm long; although the plant is nearly glabrous, the stem has a few short jointed hairs present, and the upper surfaces of some of the leaves have a few capitate-glandular ones present.

If the corolla both expanded and constricted more abruptly, and if it were pentangular above, it would be reminiscent of a large species of *Margaranthus*. The corolla is not funnelform and Ipomoea-like as in *Cacabus*, sens. str.; the fruiting calyces are similar to those found in *Physalis*. One has the alternatives of creating for it a new genus in the *Solaneae-Lyciinae* of Wettstein in *Die Natürlichen Pflanzenfamilien*, of placing it in *Margaranthus* as an anomalous species, or of treating it as an anomalous species of *Physalis*. Believing that the latter disposition better indicates its possible relationships, the author is so treating it.

9. *Physalis campanula* Standley & Steyermark, Field Mus. Publ. Bot. 23: 18-19. 1943.

Branching herb, only ends of branches collected; herbage covered with spreading jointed hairs of varying lengths, some capitate-glandular; stems glabrescent; leaf blades ca. ovate, the larger ones 5-7 cm long, sometimes with 1-3 irregularly shaped teeth or lobes on each margin, attenuate; most branch leaves 3-5 cm long with entire margins; petioles 1-4 cm long; flowers solitary; flowering calyx nearly oblong, 8-10 mm long and 7-8 mm wide, the upper 3-5 mm differentiated into deltoid acuminate lobes 3-5 mm long with ciliate margins; corolla immaculate, tubular, somewhat swollen above the calyx and slightly constricted at the minutely 5-dentate apex, 17-18 mm long and 8-9 mm wide; anthers ca. 3 mm long, bluish, on filaments 5-7 mm long, equally inserted near the base of the corolla with tomentose areas extending 1-2 mm above the point of insertion; fruiting calyx (only 1 approaching maturity) 25 mm long and 17 mm wide, the berry ca. 1 cm in diameter.

GUATEMALA: Volcán Tacana, along Quebrada Canjula between Sibinal and Canjula, Feb. 18, 1940, *Steyermark 36067* (Type: F).

10. *Physalis glutinosa* Schlechtendal, *Linnaea* 19: 310-311. 1846; *Cacabus mexicanus* S. Watson, Proc. Amer. Acad. Arts & Sci. 18: 127. 1883; *Physalis eximia* Standley, Field Mus. Publ. Bot. 17: 273-274. 1937.

Herbaceous, or perhaps somewhat woody below, branched, as much as 1.3 m tall and broad, or "in crevices of cliffs, half-woody, hanging"; herbage somewhat glutinous-vestite with spreading, jointed, flattened hairs 1-1.5 mm long intermingled with shorter ones, many of

the hairs capitate-glandular, sometimes only a few long ones present; leaf blades ovate, sometimes cordate, larger ones 3-6 cm long and 2-5 cm wide, rarely sub-rotund; branches often have only smaller leaves; leaf margins dentate-sinuate, often with 5-10 irregularly shaped teeth on each side, sometimes nearly entire; leaf surfaces often spreading-hairy below and appressed hairy above, sometimes only along the principal veins below and reduced above to a few short hairs or hair-bases; petioles of principal leaves 2-6 cm long; flowers axillary, solitary, large; flowering calyx oblong or ovate-oblong, often 5-8 mm wide at base and 8-12 mm wide at base of calyx lobes, and 10-18 mm long, the upper one-fourth to two-thirds divided into narrowly triangular, sometimes acuminate, lobes 4-11 mm long; corolla campanulate to subcampanulate, 20-35 mm long and 3-4 cm wide when fully expanded, limb not reflexed, not at all 5-lobed, yellowish distally, with 5 large purplish-splotched areas which may cover most of the corolla, these rarely seemingly absent in herbarium specimens; anthers yellow with a slight bluish tinge, 3.5-5 mm long and 1.3-2 mm wide on slender glabrous filaments 10-15 mm long; style 2-3 cm long; pedicels 7-20 mm long; fruiting calyx 10-ribbed, hairy, 25-45 mm long and 20-30 mm wide on pedicels 10-23 mm long; berry 12-20 mm in diameter.

10a. var. *glutinosa*

Corolla limb maculate with 5 large purplish, often nearly contiguous, areas; vestiture rather dense, often giving the plant a slightly greyish appearance.

SELECTED SPECIMENS. MEXICO: DURANGO: grasslands with sparse growth of oak scrub, 14 miles w of Durango, June 21, 1950, *Maysilles 7014* (MICH); Durango and vicinity in 1896, *Palmer 313* (BM, F, GH, NY); mountainside, 5 miles sw of Durango, 3 feet tall, corolla pale maroon inside, *Waterfall 15409* (BM, F, GH, HAL, NY, OKLA, P, S, SMU); GUANAJUATO: many stemmed, half-woody, hanging to 1 meter, hills 24 miles w of Xichu, June 14, 1957, *McVaugh 14813* (MICH); HIDALGO: Mineral del Monte, Cuesta Blanca, in humosa terra inter rupes porphyriticas ferratas, July 1836, *Ehrenberg 585* (Type: HAL); Pachuca to Real del Monte, May 1828, *Graham 268* (BM); hills above Pachuca, Aug. 5, 1898, *Pringle 7576* (F, VT); SAN LUIS POTOSI: in 1878, *Parry & Palmer 650* (GH, NY, P); in montibus San Migueliteo in 1876, *Schaffner 704* (Type collection of *Cacabus mexicanus* Watson: GH, NY); ZACATECAS: south slope of La Bufa, Aug. 10, 1948, *Dressler 112* (GH); plant 5 ft. broad and high, hills, Oct. 26, 1888 *Pringle 1742* (F, GH, NY, UC, VT).

var. *eximia* (Standley) Waterfall, comb. et stat. nov., *P. eximia* Standley, Field Mus. Publ. Bot. 27: 273-274. 1937.

MEXICO: CHIHUAHUA: Majalca, June 24, 1935, *LeSueur 894* (Type: F); *LeSueur 115*, Aug. 18-20, 1935 (F, GH, UC).

This taxon is similar to var. *glutinosa*, but with the

corolla immaculate, or nearly so, and the plant less densely vestite, appearing greener.

11. *Physalis cinerea* Waterfall, sp. nov.

Planta cinerea; foliis ramealibus ovatis inaequalibus, 2-3 cm longis 15-25 mm latis; corollis immaculatis campanulatis 25-30 mm longis; antheris flavis 3-4 mm longis et 1.5-2 mm latis; filamentis 10-12 mm longis.

Physalis cinerea is similar to *P. glutinosa*, but is smaller and is cinereous with short, stiffly spreading, flattened, jointed hairs, some of which are capitate-glandular; principal leaf blades (from branches only) are smaller than in *P. glutinosa*; flowering calyx 10-12 mm long and 5-8 mm wide, divided about one-third to one-fourth way into deltoid, slightly acuminate lobes; no dark spots are evident in the specimens seen, but this characteristic is sometimes lost in drying; mature fruits unknown.

MEXICO: SAN LUIS POTOSI: in the region of San Luis Potosí, alt. 6000-8000 ft., *Parry & Palmer* 649 (Type: NY, Isotype: GH).

12. *Physalis viscosa* L., *Species Plantarum* 183. 1753; *P. curassavica* L., *ibid.* 182, *P. pensylvanica* L., *Sp. Pl.*, ed. 2: 1670. 1762; other synonymy listed under the varieties.

Since several of the varieties are extra-limital, no inclusive species description is here included.

12a. var *cinerascens* (Dunal) Waterfall, *Rhodora* 60: 136. 1958; *P. pensylvanica* L., var. *cinerascens* Dunal in *D. C. Prodrum* 13(1): 435-436. 1852; *P. curassavica* L., var. *integrifolia* Dunal, *l.c.* 438; *P. mollis* Nutt., var. *cinerascens* (Dunal) Gray, *Proc. Amer. Acad. Arts & Sci.* 10: 66. 1875; *P. cinerascens* (Dunal) Hitchc., *Spring Flora of Manhattan* 32. 1894; *P. mollis* Nutt., var. *parviflora* Rydb., *Mem. Torr. Bot. Club* 4: 355. 1896; *P. saltillensis* Fernald, *Proc. Amer. Acad. Arts & Sci.* 35: 568-569. 1900.

Perennial, 5-80 cm tall, erect to decumbent, covered to a greater or lesser degree with stellate, or somewhat dendritic, hairs of varying size; principal leaf blades 1.5-7 cm long, and 1.5-5 cm wide on petioles 1-5 cm long; leaf-margins dentate, undulate or entire; corolla yellowish, dark-maculate, 9-15 mm long, and 8-16 mm wide, reflexed-rotate when fully expanded, on pedicels 7-35 mm long; fruiting calyx 15-35 mm long and 15-28 mm wide, half to three-fourths filled by the berry, on pedicels 8-40 mm long.

SELECTED SPECIMENS. MEXICO: CHIAPAS: Escuintla, May 13, 1936, *Matuda* 239 (MICH, US, VT); Hacienda Monserrate, Sept. 1923, *Purpus* 9212 (GH, NY, UC); CHIHUAHUA: Aldama, May 15-17,

1908, *Palmer 240* (F, GH, MICH, NY, US); COAHUILA: Sierra de Santa Rosa s of Muzquiz, July 8, 1938, *Marsh 1269* (F, GH); near Saltillo, Sept. 1898, *Palmer 332* (Type of *P. saltillensis*: (MICH, NY, US); Parras, July 1910, *Purpus 4601* (F, GH, UC, US); along arroyo in desert, 18 miles ne of Saltillo, Aug. 6, 1957, *Waterfall 13230* (F, HAL, MICH, OKL, OKLA, S, SMU); DISTRITO FEDERAL: Apr. 10, 1938, *Balls 4144* (BM, UC, US); GUANAJUATO: Silao, May 19, 1891, *Pringle 5148* (GH, VT); with *Prosopis* and *Acacia*, 14 miles se of Leon, Aug. 16, 1957, *Waterfall 13880* (OKLA); HIDALGO: valley near Tula, July 16, 1896, *Pringle 6362* (BR, F, GH, NY, UC, US, VT); MEXICO: Vallée de Mexico, 1865, *Bourgeau 112* (BR, GH, US); MORELIA: *Arsène sin. num.* (F); NUEVO LEÓN; w of Linares, Aug. 8, 1930, *Bartlett 10831* (F, GH, MICH); Hacienda Pablillo, Galeana, *Taylor 44* (F, GH, NY); desert between mountains, 22 miles w of Monterrey, *Waterfall 15316* (OKL, OKLA, SMU); OAXACA: San Geronimo, July 1-5, 1895, *Nelson 2770* (GH, US); PUEBLA: San Luis Tultitlanapa, *Purpus 3583* (UC); QUERETARO: San Juan del Rio, Aug. 18, 1905, *Rose et al 9534* (NY, US); desert hillside, 2 miles ne of Zimapan, Aug. 20, 1957, *Waterfall 14121* (OKL, OKLA, P, SMU); SAN LUIS POTOSÍ: region of San Luis Potosí, 1878, *Parry and Palmer 641* (GH, NY, US); along arroyo running through shrubs, 25 miles ne of San Luis Potosí, Aug. 20, 1959, *Waterfall 15709* (OKLA, SMU); TAMAULIPAS: circa Matamoros urbem, 1831, *Berlandier 2316* (Lectotype: GH, Isolectotype: F); Tampico, Jan. 1-31, 1910, *Palmer 126* (BM, F, GH, NY, US); in canyon 4 km w of Miquihuana, Aug. 4, 1941, *Stanford, et al 674* (GH, OKLA, UC); ZACATECAS: near Concepcion del Oro, Aug. 11-14, 1904, *Palmer 318*, (NY); YUCATAN: in 1895, *Gaumer 482* (NY); Chichen Itza, June 6, 1932, *Steere 1008* (F, MICH).

The type collection, *Berlandier 2316* from near Matamoros, has slightly sinuate-dentate leaves. There are collections with entire, often relatively broader, leaves which appear to belong to a distinct phase, but there are many intermediates. Indeed the type itself is intermediate between the phase with entire margins and the one with dentate leaves. Since the two occur from Kansas to central Mexico, no nomenclatural differentiation is made here.

12b. var. *spathulaefolia* (Torr.) Gray, Proc. Amer. Acad. Arts & Sci. 10: 67. 1875; *P. lanceolata* Michx. var. *spathulaefolia* Torr., Bot. Mex. Bound. 153. 1859.

Leaf blades ovate to lanceolate or spathulate, basally tapering, petioled.

MEXICO: TAMAULIPAS: en las dunas que separan la Laguna Madre y el Golfo, Rancho El Mezquite, Mar. 13, 1963, *Gonzales 55* (MEXP).

12c. var. *sinuatodentata* Schlechtendal, Linnaea 19: 309 1846.

P. curassavica L., var. *sinuato-dentata* (Schlecht.) Dunal in D. C., Prodrumus 13 (1): 438. 1852.

This is very similar to var. *cinerascens*, but appears to be a weakly differentiated local variety from coastal sand dunes near Vera Cruz. It consists of small plants having dendritic or fasciculate hairs in addition to the stellate ones, coarsely dentate leaves varying to entire, and elongate cord-like rhizomes.

SPECIMENS EXAMINED. MEXICO: VERACRUZ: Mexico, *Ehrenberg* (Type: HAL); VERA CRUZ, 1853, *Muller 175* (NY) in collibus arenosis pr. Veracruz, July 1828, *Schiede 190* (HAL); sand dunes, Veracruz, June 24, 1901, *Pringle 8517* (F, NY, OKLA, P, UC, US, VT).

12d. var. *yucatanensis* Waterfall, var. nov.

Planta vestita, trichomatibus dendriticis vel stipato-stellatis ad 2 mm longis.

This variety is characterized primarily by the spreading dendritic trichomes of the stem, petioles, pedicels and calyces, the longer ones 0.5-2 mm long, some of them stipitate, the basal one-third to two-thirds unbranched; similar hairs present to a greater or lesser extent on the leaf blades where they are often smaller.

SPECIMENS SEEN. MEXICO: YUCATAN: Chichankanab, *Gaumer 1798* (Type: F, Isotypes: BM, NY, US); *Gaumer 482* (BM, F, GH, US) not all duplicates are this species), Chichankanab, *Gaumer 1518* (F, US); Izamal, *Gaumer 2427* (F); 2 ft. high, Izamal, *Gaumer 23166* (F); Mérida, *Rivas 16* (F); Tirul, Mar. 6, 1903, *Seler 3911* (F, GH); Chichen Itza, June 6 & 29, 1932, *Steere 1008 & 1647* (F) Muna, July 22, 1932, *Steere 2109* (F).

13. *Physalis Mcvaughii* Waterfall, sp. nov.

Frutex, 1.5-2.5 m alta; trichomatibus paucis brevibus; foliis ovatis vel rhombico-ovatis, attenuatis, majoribus 7-13 cm longis et 4-9 cm latis, integerrimis vel paucidentatis, petiolis 1.5-5.5 cm longis; calycibus floriferis 8-9 mm longis et 10-15 mm latis ad basim loborum; calycis lobis deltoidibus 3-5 mm longis; pedicellis 25-30 mm longis; corollis maculatis campanulato-rotatis vel reflexo-rotatis, 11-13 mm longis et 20-25 mm latis; antheris violaceis, 2.7-3.5 mm longis, filamentis 3-4 mm longis; calycibus fructiferis decagonatis, 25-45 mm longis et 25-35 mm latis; pedicellis fructiferis 4-5.5 cm longis; baccis 15-20 mm latis.

This nearly glabrous species of *Physalis* is characterized by its large fruiting calyces, 10-angled, but with the primary angles more prominent than the secondary ones,

borne on long pedicels 4-5.5 cm in length. The hardened stems appear to be of a persistent herbaceous type becoming woody.

SPECIMENS SEEN. MEXICO: JALISCO: shrub 2 m high, precipitous mountainsides with tall wet mixed forest of firs and deciduous trees, 3-5 miles nw of San Miguel de la Sierra, Nov. 3, 1962, *McVaugh 22034* (Type: MICH); steep mountain slopes in moist fir forest, Nov. 12-13, 1952, *McVaugh 14064* (MICH); single-stemmed shrub 1.5-2.5 m high, fir forest on steep mountainsides 11-12 miles s of El Rincon, *McVaugh 21512* (MICH).

14. *Physalis stapelioides* (Regel) Bitter, in Fedde, Spec. Nov. 18: 5-7. 1922; *Saracha stapelioides* Regel, Supplm. Hort. Bot. Petropol. 18. 1864; *Saracha stapeliaflora* Dcne., Catal. Mus. d'Hist. Nat. Paris 7. 1863 (nomen nudum); *Physalis acuminata* Greenman, Amer. Acad. Arts & Sci. 35: 311. 1900.

Suffrutescent, or "soft-shrubby", the collected branch-ends sometimes herbaceous, 1-3 m high, stem as much as 3 cm thick; herbage with jointed, spreading hairs, some as much as 2-3 mm long, others much shorter, some capitate-glandular, the glands often reddish or brownish; leaf blades ca. ovate, acuminate, in two ranges of contrasting sizes, the larger ones, especially on the main stem, 10-20 cm long and 8-15 cm wide on petioles 4-13 cm long, smaller ones often 6-8 cm long and 4-5 cm wide on petioles 2-3 cm long; branch-ends with only smaller leaves sometimes collected; leaf surfaces usually with a few appressed hairs; flowers single; flower buds large immediately prior to anthesis, as much as 10 mm long and 7-8 mm wide; calyx at anthesis oblong to oblong-flaring, 10-15 mm long, the upper one-third to one-half divided into lanceolate to lanceolate-ovate acuminate lobes, 8-9 mm wide basally to sometimes 12-13 mm wide at base of calyx lobes; corolla light yellow, 15-25 mm long and 25-35 mm in diameter when fully expanded, pentangular with slight sinuses between the somewhat acuminate apices, conspicuously maculate with 5 clusters of discrete spots, densely matted-hairy in the tube below the maculations; anthers oblong-ovate, bluish, 4-5 mm long on glabrous filaments 4-7 mm long; fruiting calyx 10-angled, the sinus-veins not prominent, sometimes 2-branched, covered with long and short hairs, some glandular-capitate, ca. ovate, 25-40 mm long, on pedicels 10-25 mm long; berry oily, 12-20 mm in diameter, sessile, or essentially so, on the invaginated calyx-base.

SELECTED COLLECTIONS. MEXICO: DISTRITO FEDERAL: loose bushy shrubs to 10 ft. tall and as much through, in open places in forest, Desierto de los Leones, 10000 ft altitude, Mar. 28, 1938, *Balls 4060* (BM, GH, MICH, UC, US); GUERRERO: by stream in oak and pine forest, Teotepec, May 20, 1939, *Hinton 14299* (F, GH, US); top of Sierra Madre near Chilpancingo, Dec. 24, 1894, *Nelson 2229* (GH,

US); HIDALGO: between Pachuca and Real del Monte, *Rose, et al*, 8677 (US); JALISCO: simple shrub to 2 m, abundant in fir zone at head of Barranca de la Rosa, northeastern slopes of Nevado de Colima below Canoa de Leoncito, Oct. 10, 1952, *McVaugh 13417* (MICH, OKLA); soft shrub to 8 ft. branches over 1 inch diameter, pine-fir forest, north slope of Nevado de Colima, Aug. 25, 1957, *Straw & Gregory 1241* (MICH); MEXICO: Sierra de las Cruces, Oct. 23, 1892, *Pringle 5315* (*P. acuminata*, Type: GH, Isotype: F); Under cliffs, Sierra de las Cruces, 10000 ft, Sept. 12, 1904, *Pringle 13128* (F, GH, MICH, OKLA, US, VT); MICHOACAN: pine-fir forests, mountains w of Cerro San Andres, 8-10 miles nw of Ciudad Hidalgo, Mar. 19, 1949, *McVaugh 9940* (F, OKLA); VERACRUZ: Orizaba, *Botteri 220* (GH).

15. *Physalis orizabae* Dunal, in D.C. Prodrumus 13 (1): 452. 1852; *P. subintegra* Fernald, Proc. Amer. Acad. Arts & Sci. 35: 567-568. 1900.

Perennial from a woody, sometimes slender elongate, base, 15-45 cm high; vestiture of short antrorsely curled hairs often intermixed with varying amounts of long jointed hairs, 1-2 mm long, the latter often more abundant on the pedicels and calyces; leaf blades broadly to narrowly ca. ovate, principal ones usually 3-5 cm long and 2-3 cm wide their margins usually entire, but sometimes with 1-3 irregularly shaped teeth on each side; blades often with only a few scattered, often appressed, hairs; petioles of principal leaves 1-2 cm long; calyx at anthesis oblong to more or less campanulate, 6-10 mm long and 5-10 mm wide at base of lobes, upper one-third to one-half divided into lanceolate to ovate-deltoid, sometimes acuminate, lobes; vestiture of calyx of varying amounts of long flattened jointed hairs, more or less spreading; pedicels 10-15 mm long; corolla yellowish, prominently maculate, 12-22 mm long and 15-30 mm in diameter when fully rotate-opened, tomentose in the throat, and with jointed, appressed hairs on the outside; anthers nearly oblong, bluish or violet, 2.2-3 mm long on glabrous, somewhat thickened, filaments 3-5 mm long; fruiting calyx 10-angled or 10-ribbed, often large when fully developed, 2-4 cm long and 18-35 mm wide on pedicels 10-15 mm long; berry 1-2 cm in diameter, sessile to subsessile on the barely invaginated calyx.

SELECTED COLLECTIONS: MEXICO: AGUASCALIENTES: oak forests near summit of Sierra del Laurel, 10 miles se of Calvillo (somewhat questionably referred to this species), *McVaugh 18439* (MICH, OKLA); DURANGO: Tejaman, Aug. 21-27, 1906, *Palmer 480* (F, GH, NY, US); in pine woods 3 miles sw of El Salto, *Waterfall 16186* (F, GH, OKLA, SMU); DISTRITO FEDERAL: Sierra de Ajusco, 9000 ft, June 6, 1904, *Pringle 13277* (F, GH, MICH, OKLA, UC, US, VT); HIDALGO: Real del Monte, May 27, 1827, *Berlandier 248* (BM); Sierra de Pachuca, July 21, 1901, *Rose & Hay 5576* (GH, NY, US); JALISCO: cut-over and grazed mountainsides in oak zone, se slopes of Cerro

Gordo, 12 miles se of Tepatitlan, Aug. 29, 1958, *McVaugh 17508* (MICH); near Huejuquilla, Aug. 25, 1897, *Rose 2577* (GH, US); MEXICO: Carboneras, Río Verde, Temascaltepec, June 26, 1935, *Hinton 7717* (F, GH, MICH, NY, US); Sierra de las Cruces, 10000 ft, Sept. 10, 1899, *Pringle 8225* (Type of *P. subintegra*: GH, Isotypes: BR, F, OKLA, UC, US, VT); MICHOACAN: w of Tancitaro, July 19, 1940, *Leavenworth 296* (F, MICH, NY); near Hamburg Courts, Lago Patzcuaro, Aug. 20, 1949, *White 238* (OKLA, US); MORELOS: in mountains near Cuernavaca, Aug. 10, 1949, *White 234* (OKLA, US); NUEVO LEÓN: in open woods, San Francisco Canyon, 15 miles sw of Pueblo Galeana, *Mueller 346* (F, GH, MICH); OAXACA: nw slope of Mt. Xempoaltepec, 8000 to 10000 ft, *Nelson 681* (GH, US); PUEBLA: in pine woods, San Manuel de la Sierra, Sierra Negra, 10400 ft, *Balls 4464* (BM, UC, US); abundant near San Martin, July 14, 1929, *Mexia 2654* (BM, F, MICH, NY, UC); QUERÉTARO: Zimapan, *Cottam 10439* (US); mountain-side 34 miles se of San Juan del Rio, Aug. 18, 1957, *Waterfall 14020* (F, GH, MICH, OKLA, P, SMU); SAN LUIS POTOSÍ: Alvarez, July 13-23, 1904, *Palmer 225* (GH, US); TAMAULIPAS: top of mountains, Santa Rita Ranch, April 7, 1926, *Runyon 1051* (US); TEPIC: Sierra Madre between Dolores and Santa Gertrudis, Aug. 1897, *Rose 2049* (GH, NY, US); VERACRUZ: between Banderilla and Jalapa, Feb. 15, 1943, *Gilly et al 146* (MICH); ad radices montis Orizaba, Sept. 1828, *Schiede, sin num* (Type: HAL).

This variable species shows increasing variation at the lower altitudinal and the northern geographic limits of its range. Even near the center of its range the vestiture, size of fruits and of flowers vary considerably. The TYPE, from the foot of Mt. Orizaba, has abundant spreading hairs on the flowering calyces and pedicels. The type of *P. subintegra*, from Sierra de Las Cruces, has spreading to antrorsely curled hairs on the flowering calyces and pedicels and develops the extreme in large thick fruiting calyces. Some collections show the vestiture of the leaves and young stems varying toward shorter, denser, more appressed hairs, approaching *P. chenopodifolia* (*P. puberula*) in that respect.

16. *Physalis ingrata* Standley, Field Mus. Publ. Bot. 17: 391. 1938.

Plant herbaceous, or woody below, from a woody root; stems 15 cm (in Type) to 60 cm tall, vestiture of short, retrorse-spreading to spreading hairs; leaf blades ovate, the principal ones 3-5 cm long and 18-25 mm wide, their surfaces more or less vestite with short, spreading to somewhat appressed hairs; petioles 7-20 mm long; flower-buds prior to anthesis ca 6 mm long and 5-6 mm wide; flowering calyx broadly oblong to hemispheric or somewhat campanulate,

6-9 mm long and 5-6 mm wide at base of the lanceolate-ovate to deltoid, slightly acuminate, calyx lobes, which are 3-5 mm long; pedicels 7-12 mm long; corolla campanulate, yellowish, dark-maculate, 10-12 mm long and 7-12 mm wide; anthers nearly oblong, 3-4 mm long, yellow with a bluish or greenish-blue tinge, on glabrous filaments 3-4 mm long; fruiting calyx (immature) 17-20 mm long and 11-12 mm wide; berry ca. 8 mm in diameter, sessile or on a stipe as much as 0.5 mm long on the slightly invaginated calyx-base.

HONDURAS: on rocky hillside above Siguatepeque, July 14, 1936, *Yuncker, et al 5865* (Type: F, Isotype: GH); *Yuncker; et al 5794* (F, GH).

17. ***Physalis aggregata*** Waterfall, sp. nov.

Planta herbacea, trichomatibus articulatis, brevibus, apice capitato-glanduliferis, et etiam paucis longioribus, 0.5-1.5 mm longis; foliis lanceolatis vel ovato-lanceolatis, integerrimis vel paucidentatis, 6-10 mm longis et 3-5.5 mm latis, petiolis 2-4.5 cm longis; floribus aggregatis; calycibus floriferis 5-7 mm longis et 5-7 mm latis; calycis lobis ovatis, 3-3.5 mm longis; pedicellis 4-6 mm longis; corollis 9-10 mm longis et 13-15 mm latis; antheris flavis vel violaceo-flavis, 2.5-3 mm longis; filamentis 3-4 mm longis; calycibus fructiferis 15-20 mm longis et 12-13 mm latis; baccis 10-11 mm latis.

MEXICO: OAXACA: Rancho de Calderón, 5500 ft, San Juan, *L. C. Smith 771* (Type: GH).

This peculiar species, known only from the type collection, is characterized by its aggregations of 3-7 flowers to form an inflorescence (apparently by branch-reduction, the axis, and sometimes bracteal leaves, present), although the first-formed flowers are solitary and axillary; the jointed trichomes are of two kinds, a dense layer of short, often capitate-glandular ones, and scattered longer ones 0.5-1.5 mm long; the rather immature flowering calyx is nearly filled by the berry.

18. ***Physalis lassa*** Standley & Steyermark, Field Mus. Publ. Bot. 23: 19-20. 1943.

Perennial, stems herbaceous, or woody below, 30-60 cm tall, from a woody base, densely covered with flat, jointed spreading hairs tapering apically on the TYPE, but some hairs having small capitate glands in some of the associated material; leaf blades ovate, acute, sometimes subcordate, more or less densely covered with soft spreading hairs above and below, lighter colored below, margins entire, or rarely with 1 or 2 repand teeth on each margin; principal blades 3.5-7 cm long and 2-4 cm wide on petioles 1-2 cm long, sometimes slightly winged in the upper part; flowering calyx oblong to flaring-

oblong, 8-11 mm long and 5-7 mm wide at base of lobes, upper one-third to two-thirds divided into narrowly deltoid or ovate-lanceolate to ovate-deltoid lobes, on pedicels 6-8 mm long; corolla yellowish, dark-maculate, tomentose in the throat, 10-15 mm long and 12-15 mm wide when fully open; anthers bluish, oblong, ca. 4 mm long and 1 mm wide on filaments of about equal length; fruiting calyx 10-ribbed or slightly 10-angled, 25-35 mm long and 17-25 mm wide; berry 10-15 mm in diameter, essentially sessile on the slightly (2.5 mm) invaginated calyx base.

SELECTED SPECIMENS. MEXICO: GUERRERO: vicinity of Acapulco, Feb. 1895, *Palmer 510* (GH, US, NY); GUATEMALA: Sierra de las Minas near San Geronimo, Mar. 3, 1907, *Kellerman 6656* (F); hillside, 7200 ft, near Tecpam, July 20, 1933, *Skutch 481* (MICH, US); damp oak forest nw of Jalapa, Nov. 16, 1940, *Standley 77476* (F); between Jalapa and Montaña Miramundo, 1500-2000 m, Dec. 7, 1939, *Steyermark 32868* (Type: F); Cerro Pixpax above San Ildefonso Ixtahuacan, Aug. 15, 1942, *Steyermark 50638* (F).

19. *Physalis chenopodifolia* Lamarck, *Tableau Encycl.* 2: 28, no. 2401. 1793; *P. puberula* Fernald, *Proc. Amer. Acad. Arts and Sci.* 36: 502. 1901.

Plant herbaceous from a woody base, more or less cinereous with short, antrorsely curled hairs; leaf blades usually ca. ovate with margins irregularly coarse-dentate to repand-dentate with 1-10 teeth on each margin, or entire; calyx at anthesis oblong to flaring-campanulate, 6-10 mm long and 3-6 mm wide at base of lobes, divided one-third to two-thirds into usually narrowly deltoid-lanceolate, gradually attenuate lobes; pedicels 3-10 mm long; corolla yellowish, prominently dark-maculate, 12-20 mm long and 15-30 mm wide when fully rotate-expanded, tomentose in the throat; anthers tinged bluish or bluish-green, 2-2.5 mm long, on slender filaments 2-5 mm long; fruiting calyx 10-ribbed or slightly 5-angled with intermediate ribs or angles, 20-30 mm long and 15-20 mm wide on pedicels 1-2 cm long; berry 10-15 mm wide.

19a. var. *chenopodifolia*

Blades of principal leaves 3-7 cm long and 2-5 cm wide on petioles 10-35 mm long; plant rather cinereous with antrorsely curled hairs.

SELECTED COLLECTIONS. MEXICO: DISTRITO FEDERAL: perennial in clumps, Tlalnepantla, 7300 ft, June 9, 1901, *Pringle 8511* (F, GH, NY, UC, US, VT); MEXICO: Nanchititla, Feb. 22, 1933, *Hinton 3431* (BM, GH, F); Sacro Monte, Amecameca, *Pringle 9147* (Type of *P. puberula*: GH, Isotypes: F, US, VT); GUANAJUATO: base of hills, 34 miles north of Querétaro, Aug. 23, 1961, *Waterfall 16551* (GH, MICH, OKLA, UC, US); Pachuca, July 1905, *Rose et al 8768* (F, GH, NY, US); MICHOACAN: Morélia, 2200 m, Sept. 5, 1912, *Arsène 8658* (NY); PUEBLA: Rancho Posadas près de Puebla, July 25, 1909, *Nicolas 209* (GH, NY, P); near Calchicomula, July 24, 1901, *Rose et al 5655* (GH,

NY, US); QUERÉTARO: in dense clumps, stony flats with acacias, mimosas and cacti, 8 miles e of Querétaro, Aug. 23, 1961, *Waterfall 16521* (BM, F, GH, HAL, MICH, OKLA, UC, US); TLAXCALA: Mt. Malinche, Tecarona, 8500 ft, June 21, 1938, *Balls 4861* (UC).

The extreme with irregularly toothed leaves is represented by the type collection of *P. chenopodifolia* (P), while the type of *P. puberula* has leaves with entire margins.

19b. var. **chenopodifolia**, forma **immaculata** Waterfall, f. nov. Corolla immaculata vel subimmaculata.

MEXICO: TLAXCALA: sunny banks between cultivation, Mt. Malinche, June 21, 1938, *Balls 4861* (Type: US).

19c. var. **viridis** Waterfall, var. nov.

Planta paucivestita, laminis plus minusve viridibus, integerrimis vel paucidentatis, 30-50 mm longis et 15-27 mm latis.

MEXICO: DURANGO, Otinapa, July 25-Aug. 5, 1906, *Palmer 420* (Type: US; Isotypes: F, GH, NY, UC).

SELECTED COLLECTIONS. MEXICO: CHIHUAHUA: limestone hillside 32 miles s of Parral, Aug. 9, 1956, *Waterfall 12519* (F, GH, HAL, MICH, OKLA, P, S, SMU, US); COAHUILA: oak and juniper assn. on a mountain 24 km nw of Fraile, July 15, 1941, *Stanford, et al 370* (GH, NY); DURANGO: *Palmer 420*, cited under "Type"; grassland with scattered pines, 19 miles sw of Durango, Aug. 10, 1957, *Waterfall 13434* (F, GH, MICH, NY, OKL, OKLA, SMU, UC, US); TAMAULIPAS: in arroyo 19 km sw of Miquihuana, Aug. 11, 1941, *Stanford et al 918* (GH, NY); in pine forest 3 mi n of Miquihuana, July 14, 1949, *Stanford, et al 2438* (US).

This species varies into its northern extreme with vestiture less abundant, but present in varying quantities, leaves usually entire, their blades somewhat smaller than in var. *chenopodifolia*.

19d. var. **exigua** Waterfall, var. nov.

Planta parvior, laminis parvis, inaequaliter paucidentatis vel integerrimis.

MEXICO: SAN LUIS POTOSI: Charcas, July-Aug., 1934, *Lundell 5398* (Type: MICH; Isotype: US).

SELECTED SPECIMENS. MEXICO: DURANGO: open pine-oak woods 5.5 mi w of Durango, Aug. 12, 1957, *Waterfall 13617* (OKLA); GUANAJUATO: subhumid oak forest on steep slopes, 14.5 mi from Guanajuato on road to Dolores Hidalgo, July 5, 1955, *Johnston 2626* (OKLA); valley near Tula, July 16, 1896, *Pringle 7334* (GH, US, VT); QUERÉTARO: cliff sides and top, 15 mi se of San Juan del Rio, Aug. 17, 1957, *Waterfall 13962* (BM, F, GH, MICH, OKLA, P, SMU); SAN LUIS POTOSÍ: region of San Luis Potosí, in 1878, *Parry & Palmer 642* (GH, NY, P, US); *Lundell 5398*, Type, cited above.

This variety is characterized by the small leaf blades,

the principal ones 10-25 mm long and 5-15 mm wide, with margins coarsely and irregularly few-toothed, or, rarely, subhastately lobed, on petioles 3-10 mm long. In kind of vestiture it tends toward the coarser trichomes of *P. orizabae*.

19e. var. *glandulosa* Waterfall, var. nov.

Planta viscida, trichomatibus articulatis capitato-glandulosis vel attenuatis.

MEXICO: QUERÉTARO: cliffs on steep mountainsides, 22 miles ne of Zimapan, Aug. 20, 1957, *Waterfall 14170* (Type: OKLA); Isotypes (MICH, US).

20. *Physalis hastatula* Waterfall, sp. nov.

Planta herbacea perennis; caulibus 9-10 dm longis, procumbentibus vel suberectis et ramosis, subglabris vel trichomatibus paucis brevibus antrorsis; foliis lanceolatis vel angusto-lanceolatis, subhastatis vel integerrimis, principalibus 4-6 cm longis et 3-4 mm latis, petiolis 12-22 mm longis; calycibus floriferis 4-6 mm longis et 3-4 mm latis ad basim loborum; calycis lobis lanceolatis, 3-4 mm longis; pedicellis 4-7 mm longis; corollis maculatis, 8-10 mm longis et 3-4 mm latis; antheris violaceis, 1.5-2 mm longis, filamentis 2.5-4 mm longis; calycibus fructiferis decagonatis subtilibus, 17-23 mm longis et 12-15 mm latis, baccis 7-10 mm latis.

SPECIMENS SEEN. MEXICO: JALISCO: prostrate, vine-like, a few plants in shade of north-facing rocks, Cerro La Campana, near km 36 sw of Ojuelos on road to Aguascalientes, Aug. 9-12, 1958, *McVaugh 16778* (Type: MICH, Isotype: OKLA); bushy, near km 31 sw of Ojuelos on road to Aguascalientes, Aug. 13, 1958, *McVaugh 16889* (MICH, OKLA).

This species is characterized by being nearly glabrous, having narrow leaves with a large subbasal tooth or small lobe on each side, sometimes 2 teeth, sometimes entire, and by the 10-angled fruiting calyx with the primary angles more prominent than the secondary ones.

21. *Physalis gracilis* Miers, Annals and Magazine of Natural History, ser. 2, 4 : 37. 1849; *P. Schiedeana* Dunal in DC., Prodrum 13 (1): 452. 1852.

Herbaceous, 60-120 cm tall, erect or reclining on bushes to procumbent and, sometimes, repent, more or less vestite with flat, jointed, usually spreading hairs ca. 1-1.5 mm long, sometimes glabrate or nearly glabrous; leaf blades ovate, sometimes broadly so, principal ones 3-10 cm long and 2-8 cm wide, surfaces spreading-hairy, or appressed-hairy or glabrous, entire to irregularly few-toothed, petioles 2-6 cm long; flowering calyx usually spreading-hairy, sometimes

glabrous, 5-10 mm long and 4-7 mm wide at base of calyx lobes which tend to be ovate-deltoid and are 2-3 mm long; flowering pedicels 7-15(-20) mm long; corolla maculate, 10-13 mm long and 13-16 mm wide when open-reflexed, hairy pads below the five spots; anthers yellowish, sometimes with a slight bluish tinge which may be more pronounced in fresh material, 3-4 mm long on filaments 2-5 mm long; fruiting calyx 10-ribbed to nearly terete, 22-30 mm long and 14-25 wide on pedicels 10-20 mm long; berry nearly spheric, 8-15 mm in diameter, sometimes slightly stipitate on the invaginated calyx base.

SELECTED COLLECTIONS. MEXICO: CAMPECHE: Yohaltun, Jan. 4, 1901, *Goldman 538* (US): moist soil along river, Champoton, July 7-15, 1932, *Steere 1767* (MICH); DISTRITO FEDERAL: Canada de Contreras, June 1, 1963, *Galvan s.n.* (OKLA); HIDALGO: Real del Monte, Aug. 1840, *Galeotti 1199* (BR, P); MORELOS: perennial, climbing among shrubs to 12 ft, wet banks, barranca near Cuernavaca, June 1895, *Pringle 6319* (BM, BR, F, GH, NY, UC, US, VT); NAYARIT: Sierra Madre near Santa Teresa, Aug. 10, 1897, *Rose s.n.*, (US); OAXACA: Zacuapan, Nov.-April, 1840, *Galeotti 1190* (BR); PUEBLA: near Tehuacan, Dec. 22, 1895, *Pringle 7034* (GH, VT); SAN LUIS POTOSÍ: Tamazunchale, Nov. 26, 1937, *Kenoyer 826* (F); 2 km nw of Tampacan, Mar. 27, 1959, *Rzedowski 10268* (OKLA); TABASCO: along Rio Grijalva n of Villahermosa, Sept. 24, 1944, *Gilly et al 330* (MICH); in second growth, La Palma, Balancan, June 1-6, 1939, *Matuda 3312* (F, GH, MICH, NY); VERACRUZ: Maltrata, May 12, 1937, *Matuda 1359* (GH, MICH, US); stems creeping, barranca of Texolo, 3000 ft, April 30, 1899, *Pringle 8142* (BM, BR, F, NY, P, UC, US, VT). BRITISH HONDURAS: at edge of forest, Mountain Pine Ridge, San Agustin, July-Aug. 1936, *Lundell 6836* (GH, MICH, NY, OKLA, US). COSTA RICA: Los Diamontes, Dec. 2, 1953, *Heiser 3781* (F). EL SALVADOR: vicinity of San Salvador, Jan. 4, 1922, *Standley 19142* (GH, NY, US); procumbent, moist thicket, vicinity of Metapan, Jan. 29-Feb. 1, 1947, *Standley & Padilla 3130* (F). GUATEMALA: weedy stream side, Quezaltenango, Oct. 8, 1934, *Skutch 1399* (GH); Esquintla, *Donnell-Smith 2089* (US); procumbent in damp thickets 43 km ne of Coban, 1200 m, *Standley 70076* (F, US); prostrate in semi-chaparral, across river from Sayaxche, May 5, 1942, *Steyermark 46312* (F, MICH, NY, US); Sierra de los Cuchumatanes, Huehuetenango, July 24, 1942, *Steyermark 49464* (F, US). HONDURAS: vicinity of San Marcos de Colon, Jan. 12-22, 1949, *Standley 15763* (F); elongate herb on shrubs in wet thicket, near Yuscaran, Dec. 11, 1946, *Standley et al 1157* (F); weed along road, Montanya Santa Barbara near Lake Yojoa, Aug. 7, 1948, *Williams & Molina 14476* (F, GH); along railroad near Ceiba, July 14, 1938, *Yuncker, et al 8414* (BM, F, GH, NY, US). NICARAGUA: path in rain forest, Jinotega, Cerro la Florida, Dec. 5, 1958, *Hawkes, et al 2166* (F).

P. Schiedeana Dunal is typified by (HAL) by a slightly

more hairy phase than is the type of *P. gracilis*. The species varies from this to nearly glabrous material.

P. Galeottiana Walpers, Repert. Bot. Syst. Lipsiae 574. 1842-1848, *nom. nov.* for *P. glabra* Mart. & Gal., Acad. Roy. des Sci. . . . Belgique, Bull. 12: 132-133. 1848, may be conspecific. The Type, *H. Galeotti 1197* (BR), Cordillera, Zacuapan, Vera Cruz, June-Oct. 1840, consists of two short vegetative branches, one with two "pairs" of leaves, and one with a single leaf. It is possible that they represent the glabrous extreme of *P. gracilis*, in which case this name has priority for the species *sens. lat.* However, it hardly seems desirable to base a species name on the slight evidence presented by inadequate vegetative material, so, unless a flowering and/or fruiting isotype should be found, and shown to belong to this species, it is proposed that the name *P. gracilis* Miers, based on adequate type material, be retained.

The nearly glabrous phase may resemble *P. philadelphia*, but may be separated from it by the longer pedicels of *P. gracilis*.

22. *Physalis luteoanthera* Waterfall, sp. nov.

Herbacea, ad 1 m alta; caulibus tenuiter erectis vel procumbentibus; pilis longis, articulatis; foliis ovatis integerrimis vel undulato-dentatis, principalibus 6-10 cm longis et 4-6 cm latis; petiolis 15-45 mm longis; calycibus floriferis 7-10 mm longis et 6-10 mm latis ad basim loborum; calycis lobis late ovatis, 2-3 mm longis; corollis luteis, maculatis, 12-13 mm longis et 17-23 mm latis; antheris luteis, 3-4 mm longis; filamentis 2-3 mm longis; calycibus fructiferis ca. 25 mm longis et 19-22 mm latis; pedicellis fructiferis 10-13 mm longis; baccis 8-10 mm latis.

TYPE: *Steiermark 33726* (F), shaded thickets, lower south-facing slopes of Volcan Santa Maria between Finca Pirineos and Los Positos, Dept. of Quezaltenango, Guatemala.

COLLECTIONS SEEN. EL SALVADOR: vicinity of Ahuachapan in wet thicket near stream, Jan. 16-25, 1947, *Standley & Padilla 2774* (F). GUATEMALA: *Steiermark 33726*, Jan. 8, 1940, the Type, referred to above.

23. *Physalis peruviana* L., Species Plantarum ed. 2: 1670. 1762; *P. latifolia* Lamarck, Tableau Encyclopédique et Méthodique . . . Bot. 2: 29. 1793; *P. peruviana* L., var. *latifolia* (Lam.) Dunal in DC., Prodrômus 13(1): 440. 1852.

Perennial, 0.3-1 m tall, tomentose to villous, hairs jointed, often diverging at right angles to the stem; leaf blades ovate, 5-10 cm long and 4-7 cm wide, their apices often somewhat lunate-attenuate, their bases often more or less cordate, margins entire, or with few irregular teeth; leaf surfaces with jointed hairs, somewhat appressed, more abundant on lower surfaces and along the principal veins; petioles 1-4 cm long; flowering calyx oblong to oblong-campanulate, 8-9 mm long and 4-6 mm wide at base of the triangular to ovate-attenuate calyx lobes into which the upper half of the calyx is divided; flowering pedicels 6-8 mm long; corolla 10-14 mm long and 12-15 mm wide, maculate; anthers bluish, 3.5-4 mm long, on filaments 2-4 mm long; fruiting calyx densely soft-hairy, 10-ribbed or slightly 10-angled, 3-4 cm long and 2.5-3 cm wide; berry 12-20 mm long and 10-15 mm wide on the invaginated (3-5 mm) calyx base.

SELECTED COLLECTIONS. BERMUDA: Dec. 1915, *Collins 442* (GH, NY); herbaceous shrub, Berry Hill Road, Paget, Sept. 12, 1963, *Manuel 281* (GH). HAITI: shrub or woody herb, Oriana Road, *Holdridge 824* (NY). JAMAICA: New Castle, Sept. 9, 1908, *Britton 3311* (NY); above Newcastle, alt. 4000 ft, Feb. 4, 1956, *Stearn 191* (GH).

24. *Physalis angustior* Waterfall, sp. nov.

Frutex vel herbaceo-frutex, 1-2 m altus; pilis densis, articulatis, partim glanduliferis; foliis ovatis, apice lunato-attenuatis, principalibus 6-10 cm longis et 4-8 cm latis; petiolis 3-5 cm longis; floribus singulis vel 2-3-aggregatis; calycis lobis lanceolato-attenuatis, 5-9 mm longis; pedicellis 12-20 mm longis; corollis luteis, maculatis, 15-20 mm longis et 20-29 mm latis; antheris violaceis, 3-4 mm longis; calycibus fructiferis 25-30 mm longis et 15-20 mm latis; pedicellis fructiferis 15-30 mm longis; baccis 14-16 mm longis et 12-15 mm latis.

TYPE: *Pringle 7731*, on cliffs, Sierra de Tepoxtlan, 7500 ft, Mar. 14, 1889, (VT); Isotype: (US).

COLLECTIONS SEEN. MEXICO: MORELOS: *7731*; shaded ledges, Sierra de Tepoxtlan, May 5, 1900, *Pringle 8275* (F, GH, MEXP, NY, UC, US, VT); on cliffs of Sierra de Tepoxtlan, 7500 ft, Nov. 20, 1902, *Pringle 11056* (F, GH, US, NY).

Physalis angustior differs from *P. peruviana* in its aggregations of flowers, its smaller, narrower fruiting calyx and its more woody habit.

25. *Physalis Sancti-josephi* Dunal in DC., *Prodromus* 13(1): 451. 1852.

Herbaceous, probably coarse and tall, collected tops 40-50 cm long, covered with varying densities of jointed hairs of varying lengths, the longer 1-1.5 mm long, many of them tipped with small reddish-brown glands; leaf blades ovate, slightly attenuate apically, margins usually with 1-several irregularly shaped and variable-sized teeth or

undulations on each side, sometimes entire; principal blades 6-10 cm long and 4-8 cm wide, on petioles 3-8 cm long; flowering calyces 6-10 mm long and 6-9 mm wide at base of lobes, upper 2.3-5 mm divided into lanceolate or ovate-lanceolate, somewhat acuminate lobes; flowering pedicels 5-10 mm long; corolla yellowish, maculate, 10-20 mm long and 15-22 mm wide when fully expanded; anthers bluish, 2-3 mm long, on filiform filaments 3-5 mm long; fruiting calyx with 5 prominent angles and 5 intermediate angles or ribs, 25-35 mm long and 18-25 mm wide, prominently reticulate, the principal veins usually dark-colored; fruiting pedicels 8-15 mm long; berry 8-15 mm in diameter.

COLLECTIONS EXAMINED. MEXICO: SAN LUIS POTOSI: Alvarez, July 15-23, 1904, *Palmer 220* (F, GH, MICH, NY, UC, US); herb in oak grove, 2200-2400 m, Sierra de Alvarez, July 30-31, 1934, *Pennell 17841* (NY, US); orilla de camino, km 33 de la carretera San Luis Potosí-Río Verde, July 29, 1954, *Rzedowski 3574* (MEXP); LOCALITY UNDETERMINED: pr. San Jose del Oro, reg. frigg., June 1831, *Schiede sin num* (Type: HAL).

26. *Physalis Muelleri* Waterfall, sp. nov.

Herba perennis 25-45 cm alta; trichomatibus brevibus, ad 0.5 mm longis, partim capitato-glanduliferis; foliis ovatis, inaequaliter magnodentatis, principalibus 4-8 cm longis et 2.8-5.5 cm latis; petiolis 15-35 mm longis; calycibus floriferis 6-8 mm longis et ca. 5 mm latis ad basim loborum; calycibus lobis ovato-deltaideis vel lanceolato-attenuatis 2-4 mm longis; pedicellis 5-6 mm longis; corollis luteis, maculatis, 10-12 mm longis et 12-15 mm latis; antheris luteis 3.5-4 mm longis, filamentis 3-5 mm longis; calycibus fructiferis decacostatis, trichomatibus brevibus, partim capitato-glanduliferis; calycibus fructiferis 17-22 mm longis et 15-18 mm latis; pedicellis fructiferis 10-15 mm longis; baccis 10-14 mm latis.

TYPE: Diente Canyon, mountains near Monterrey, Nuevo León, July 6, 1933, *Mueller 129* (Type: GH, Isotype: F).

This species, known only from the type locality, is characterized by its large yellow anthers, dark-maculate corolla, 10-angled or 10-ribbed fruiting calyx covered with short spreading hairs, many of them capitate-glandular, open apically, and nearly filled by the berry; also by the ovate leaves, coarsely and irregularly salient-dentate, with much of the vestiture capitate-glandular.

27. *Physalis sordida* Fernald, Proc. Amer. Acad. Arts & Sci. 35: 568. 1900.

Stems herbaceous, 10-50 cm tall from a woody base growing from a horizontal rootstock 3-5 cm below the surface of the earth; herbage

covered with usually brownish, flat, jointed, spreading hairs, up to ca. 1 mm long, some glandular-capitate; leaf blades suborbicular to ovate or lanceolate-ovate, the principal ones 3-7 cm long and 2.5-6 cm wide with vestiture similar to the stem, but less abundant and, sometimes, more appressed, margins coarsely and irregularly salient-dentate to repand-dentate to subentire, on pedicels 1.5-5 cm long; corolla yellowish, with 5 darker, but not strikingly contrasting, maculations, 10-13 mm long and 10-15 mm wide when fully rotate or rotate-reflexed, nearly pentagonal in outline, with shallow sinuses; anthers yellow, or tinged with blue or green, 3-4 mm long on somewhat thickened filaments of about equal length; fruiting calyx 10-angled or 10-ribbed, 15-30 mm long and 13-20 mm wide; berry spheric to ovoid, 10-15 mm in diameter, sessile, or essentially so, on the invaginated calyx base.

SELECTED COLLECTIONS. MEXICO: DISTRITO FEDERAL: hillside near Guadalupe, 7400 ft, July 25, 1904, *Pringle 8976* (F, GH, MEXP, NY, UC, VT); DURANGO: Inde, 2000 m. Aug. 1927, *Reko 5272* (US); GUANAJUATO: Aug. 1899, *Lugis 417* (US); HIDALGO: valley near Tula, 6800 ft, Sept. 22, 1901, *Pringle 9526* (F, GH, MEXP, NY, US, VT); MEXICO: near Guadalupe, Sept. 1903, *Rose and Painter 6841* (NY, US); OAXACA: Boca de Leon, Tlaxiahuaca, 7500 ft, *Smith 637* (Type: GH); Mt. Alban, near Oaxaca, Aug. 7, 1949, *White 225* (OKLA, US); PUEBLA: vicinity of San Luis Tultitlanapa, July 17, 1908, *Purpus 3580* (BM, F, GH, NY, UC, US); SAN LUIS POTOSÍ: in montibus San Miguelito in 1876, *Schaffner 699* (GH); TAMAULIPAS: in narrow, deep, moist arroyo in hills 19 km se of Miquihuana on road to Palmillas, Aug. 11, 1941, *Stanford et al 839* (GH, NY); ZACATECAS: south slope of La Bufa, Aug. 10, 1948, *Dressler 101* (GH). HONDURAS: Selguapa, Dept. Comayagua, Mar. 22, 1945, *Rodriguez 2551* (F).

The collection from Honduras is somewhat dubiously referred to this concept, yet it seems closer to it than to any other.

In the northern part of its range this species approaches *P. hederæfolia* var. *puberula*, but here its bluish-tinged anthers tend to distinguish it.

28. *Physalis Pennellii* Waterfall, sp. nov.

Herbacea, perennis, 5-20 cm alta; trichomatibus articulatis, longis et brevibus ad 1.5 mm longis, partim glanduliferis; foliis ovatis vel lato-ovatis vel subrotundis ad basim, principalibus 13-32(-40) mm longis et 12-25(-30) mm latis, inaequaliter paucidentatis vel undulatis vel integerrimis; petiolis 5-11(-20) mm longis; calycibus floriferis hemiglobosis, dense longipilosis, 4-5 mm longis et 4-5 mm latis ad basim loborum; calycis lobis deltoideis vel ovato-deltoideis, 2-3 mm longis; pedicellis 3-6 mm longis; corollis luteis, maculatis, 7-13 mm longis et 10-14 mm latis; antheris violaceis, ca. 2.5 mm longis; caly-

cibus fructiferis 10-costatis, 15-20 mm longis et 11-13 mm latis; pedicellis 9-15 mm longis; baccis 8-12 mm latis.

TYPE: *Pennell 17523* (US); rocky limestone west of Santa Ana, above Potrero, Sierra de Catorce, July 24, 1934; Isotype: (NY).

SPECIMENS EXAMINED: MEXICO: GUANAJUATO: Aug. 1947, *Kenoyer 2476* (GH); SAN LUIS POTOSÍ: Charcas, July-Aug. 1934, *Lundell 5399* (MICH, US); *Pennell 17523* cited under "Type".

Physalis Pennellii is most nearly related to *P. sordida* Fern., but is a more dwarf plant with a mixture of longer hairs on the herbage, and with a more densely long-hairy flowering calyx.

29. *Physalis latecorollata* Waterfall, sp. nov.

Herba perennis ca. 30 cm alta; caulibus villosis, pilis articulatis, ad 2-3 mm longis; foliis ovalibus vel ovatis, integerrimis, principalibus 50-60 mm latis et 38-42 mm latis, petiolis 15-25 mm longis; calycibus floriferis 8-9 mm longis et 7-8 mm latis; pedicellis 5-7 mm longis; corollis maculatis, 33 mm latis; antheris violaceis, 3 mm longis; filamentis filiformibus, 5-7 mm longis; calycibus fructiferis ignotis.

TYPE: *Garcia sin num* (MEXP) MEXICO: OAXACA: orilla de arroyo, campamento Rio Molino cerca de San Miguel Suchistepec, Oaxaca, alt. 2350 m, Sept. 20, 1965,

30. *Physalis philippensis* Fernald, Proc. Amer. Acad. Arts & Sci. 35: 568. 1900.

Stems 15-20 cm long, several-branched, herbaceous from a woody root; vestiture of flattened, spreading, jointed hairs of varying sizes, the longer stem-hairs 2-3 mm long; leaf blades ovate to rhombic-ovate to hastate-ovate, 15-20 mm long and 15-20 mm wide, usually with 1-3 irregularly shaped teeth, spreading-hairy to appressed-hairy on both sides, on petioles 6-12 mm long; calyx at anthesis hemispheric or more widely spreading, 5-8 mm long and 8-10 mm wide at base of the ovate-lanceolate to deltoid calyx lobes, 3-4 mm long; pedicels 5-8 mm long; corolla 12-15 mm long and 20-25 mm wide, the limb with 5 prominent violet or purplish markings, the broad, flaring tube tomentose within above the point of stamen-insertion; corolla slightly lobed, the sinuses 3-5 mm deep; anthers bluish or violet, oblong, 3-4 mm long, on slender, glabrous, violet or bluish filaments 4-6 mm long; fruit unknown.

SPECIMENS EXAMINED. MEXICO: OAXACA: Sierra de San Filipe, 9000 ft, June 1, 1894, *Pringle 5621* (Type: GH, Isotype: VT).

31. *Physalis caudella* Standley, Field Mus. Publ. Bot. 17: 273. 1937.

Perennial, apparently from a deep, not-collected rhizome, indument

of varying amounts of long jointed hairs (1-) 1.5-3 mm long, or of long and short hairs mixed in varying proportions; principal leaf blades 4-8 cm long and (6-) 15-40 mm wide, ovate-lanceolate to linear-lanceolate, on petioles 5-20 mm long; margins of blades entire to irregularly undulate to saliently few-toothed; flowering calyx 6-12 mm long and 4-6 mm wide at base of lobes, the upper 4-7 mm divided into more or less elongate lobes; flowering pedicels 5-10 mm long; corolla prominently reddish-blue or purplish maculate, 11-18 mm long; anthers bluish, reddish-blue or blue-green, ca. 3 mm long; fruiting calyx (2-) 2.5-5 cm long and (2-) 2.5-3 cm wide, divided above into lobes (6-) 10-15 (-17) mm long, its pedicel ca. 1 cm long.

31a. var. *caudella*

Leaf blades ovate to oblanceolate-ovate or lanceolate-falcate, often basally inequalateral, principal ones 4-8 cm long and 13-40 mm wide; fruiting calyx 3-5 cm long and 2.5-3 cm wide.

SPECIMENS EXAMINED. MEXICO: CHIHUAHUA: pine-oak slope, Cajurichi, Río Mayo, Sept. 13, 1936, *Gentry 2710* (Type: F, Isotypes: GH, US); Mojarachic, July 28, 1940, *Knobloch 8013* (US); near San Juanito, July 26, 1937, 7800 ft, *Shreve 8023* (F); Salto de Babicora, July 18, 1937, *LeSueur 1448* (F).

31b. var. *parva* Waterfall, var. nov.

Planta nana, foliis angustis, principalibus 4-6 cm longis et 6-12 (-15) mm latis; calycibus fructiferis 18-20 mm longis et 10-15 mm latis.

TYPE: *Townsend and Barber 122* (F), Isotypes: (BM, GH, NY, OKLA, P, UC, US, VT), MEXICO near Colonia Garcia in the Sierra Madres, 7200 ft, July 11, 1899.

Representatives of this taxon bear a striking resemblance to the type of *P. virginiana* var. *polyphylla* (Greene) Waterfall from Piedra in southern Colorado. However, the latter has yellow anthers, moderately darkened areas on the corolla, and vestiture consisting wholly of short, antrorse hairs, whereas the newly-described taxon includes plants with bluish anthers, purplish maculations, and vestiture of spreading, jointed hairs, long and short intermixed.

32. *Physalis virginiana* Miller, Gardener's Dictionary, ed. 8, no. 4, 1768.

Since this is a complex species, with its distribution principally to the north, in the United States, only the synonymy pertaining to the taxa studied here is given, and also only descriptions of these taxa.

The nearest relationship of the Mexican varieties of *P. virginiana* to other Mexican taxa appears to be with *P.*

caudella. The following key may be used to separate the varieties of these two species.

a. Anthers blue or violet; long villous hairs more or less abundantly intermixed with shorter ones.

b. Fruiting calyces large, 3-5 cm long & 25-30 mm wide; leaves broad, principal ones 4-8 cm long & 13-40 mm wide.

P. caudella var. *caudella*.

b. Fruiting calyces smaller, 18-20 mm long & 10-15 mm wide; leaves narrower, principal ones 4-6 cm long & 6-15 mm wide.

P. caudella var. *parva*.

a. Anthers yellow, or with a slight bluish tinge; vestiture short and appressed, or plant glabrous, or with a few long stiff hairs.

c. Vestiture short and appressed or plant glabrous.

d. Plant large, usually 50-60 cm tall, single-stemmed.

P. virginiana var. *sonorae*.

d. Plant small, usually 10-30 cm tall, several-stemmed.

P. virginiana var. *nana*.

c. Vestiture of few long rigid jointed hairs, short ones usually present on sepal tips only.

P. virginiana var. *longiseta*.

32a. *Physalis virginiana* Miller, var. *sonorae* (Torr.) Waterfall, *Rhodora* 60: 154. 1958; *P. pumila* Nutt., var. *sonorae* Torr., *Bot. Mex. Bound.* 153. 1859; *P. longifolia* Nutt., *Trans. Am. Phil. Soc. (n.s.)* 5: 193-194. 1836; *P. lanceolata* Michx., var. *laevigata* Gray, *Proc. Am. Acad. Arts & Sci.* 10: 68. 1875; *P. lanceolata* Michx., var. *longifolia* (Nutt.) Trel., *Rep. Ark. Geol. Surv.* 4: 207. 1891; *P. rigida* Pollard & Ball, *Proc. Biol. Soc. Wash.* 13: 134-135. 1900.

Herbaceous perennial, 30-60 cm tall, single-stemmed, often branching above, glabrous, or with short, antrorse hairs, especially on the calyces and younger parts; leaf blades lanceolate to narrowly lanceolate, principal ones 4-7 cm long and 10-16 mm wide on petioles 15-25 mm long; corolla yellow or greenish-yellow, maculate, but not as dark and prominently so as in *P. caudella*; anthers yellow.

COLLECTIONS EXAMINED. MEXICO: CHIHUAHUA: Oct. 1911, *Stearns 14* (F); SAN LUIS POTOSÍ: in 1878 (atypical, bluish anthers) *Parry & Palmer 643* (NY); lugares incultos, Zaragosa, July 7, 1954, *Rzedowski 3520* (OKLA); SONORA: Santa Cruz, Oct. 22, 1893, *Mearns 2620* (US); Fronteras, June 1850-2, *Thurber 418* (Type: GH, Isotype: F).

32b. var. *nana* Waterfall, var. nov.

Herba perennis; caulibus ramosis ad basim, 5-30 cm longis; trichomatibus brevibus, antrorsis, paucis vel nullis; foliis lanceolatis vel ovato-lanceolatis, principalibus 3-5 cm longis et 1-2 cm latis; petiolis 1-2 cm latis.

TYPE: *Waterfall 16600* (OKLA), Isotypes: (F, GH, US), grassy silty flats 38 miles se of Saltillo in NUEVO LEON, MEXICO Aug. 25, 1961,

SELECTED COLLECTIONS. MEXICO: COAHUILA: grassy flat east of Puerto de Aire at southern end of Sierra de la Encantada, Sept. 1, 1941, *Stewart 1316* (GH); NUEVO LEÓN: wet depression in calcareous desert 16 miles n of Matehuala, Aug. 21, 1959, *Waterfall 15753* (F, MICH, OKLA, SMU); *Waterfall 1660*, Type listed above; SAN LUIS POTOSI: alkaline soil in desert near Km 549, 36 miles s of Matehuala Sept. 27, 1958, *McVaugh 18209* (MICH); calcareous desert, 10 miles s of intersection of Highways 80 & 57, 74 miles north of San Luis Potosi, Aug. 20, 1959, *Waterfall 15715* (OKLA, SMU); SINALOA: vicinity of Mazatlan, Apr. 6, 1910, *Rose et al 14095* (NY, US); ZACATECAS: on road from Concepcion del Oro south of Cardono, 7 miles n of San Tiburcio, Sept. 2-3, 1938, *Johnston, I. M. 7360* (GH).

One of the above collections, *McVaugh 18209*, exhibits a vertical, elongate, hardened, corm-like rootstock, 25 mm long and 6 mm wide, dug from 11-13 cm below the surface of the earth. Other collections could have been broken away from above such a structure.

32c. var. *longiseta* Waterfall, var. nov.

Planta 15-45 cm alta; caulibus longisetis, trichomatibus paucis; foliis lanceolatis vel linearo-lanceolatis, principalibus 5-8 cm longis et 1-2 cm latis; petiolis 3-10 mm longis; calycibus fructiferis 2-3 cm longis et 15-25 mm latis; pedicellis 1-2 cm longis, saepe incrassatis in parte superiore.

TYPE: *Palmer 53* (US), Isotypes: (F, GH, NY, UC), Río Verde, San Luis Potosí, June 2-8, 1904.

COLLECTIONS SEEN. MEXICO: SAN LUIS POTOSI: Type, cited above; region of San Luis Potosí in 1887, *Parry & Palmer 647* (GH, NY, US).

TO BE CONTINUED